

YOGESH JOSHI & FRANK O'DONNELL

INDIA IN NUCLEAR ASIA

Evolution of Regional Forces, Perceptions, and Policies



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Yogesh Joshi and Frank O'Donnell



Orient BlackSwan

**INDIA IN NUCLEAR ASIA: EVOLUTION OF REGIONAL FORCES,
PERCEPTIONS, AND POLICIES**

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Bangladesh, Sri Lanka and the Maldives.

Frank O'Donnell

*To my parents, Dominic and Kathy O'Donnell,
and my wife Kimberly.*

Yogesh Joshi

To Ma and Papa

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Abbreviations

AAD	: Advanced Air-Defence
ATV	: Advanced Technology Vessel
A2/AD	: Anti-Access/Area Denial
ASATs	: Anti-Satellite Weapons
ASEAN	: Association of Southeast Asian Nations
BMD	: Ballistic Missile Defence
BJP	: Bharatiya Janata Party
CCS	: Cabinet Committee on Security
CLAWS	: Centre for Land Warfare Studies
CIA	: Central Intelligence Agency
CJCSC	: Chairman of the Joint Chiefs of Staff Committee
CWC	: Chemical Weapons Convention
COSC	: Chiefs of Staff Committee
CCTV	: China Central Television
CPEC	: China–Pakistan Economic Corridor
CTBT	: Comprehensive Test Ban Treaty
CD	: Conference on Disarmament
CBMs	: Confidence Building Measures
DRDO	: Defence Research and Development Organisation
DAE	: Department of Atomic Energy
DND	: Draft Nuclear Doctrine
ENCD	: Eighteen Nation Committee on Disarmament
EU	: European Union
FBR	: Fast Breeder Reactor
FMCT	: Fissile Material Cut-off Treaty
FMF	: Foreign Military Financing
HEU	: Highly Enriched Uranium
IAF	: Indian Air Force
IBGs	: Integrated Battle Groups

IGMDP	: Integrated Guided Missile Development Programme
ICBM	: Intercontinental Ballistic Missile
IAEA	: International Atomic Energy Agency
INSTC	: International North–South Transport Corridor
IONS	: Indian Ocean Naval Symposium
kg	: Kilograms
kt	: Kilotons
LAC	: Line of Actual Control
LoC	: Line of Control
LRTR	: Long-Range Tracking Radar
MW	: Mega Watt
MwTh	: Mega Watt Thermal
MoD	: Ministry of Defence
MTCR	: Missile Technology Control Regime
MIRV	: Multiple Independently Targetable Re-Entry Vehicle
MLRS	: Multiple Launch Rocket System
NFU	: No-First-Use
NSA	: National Security Advisor
NSAB	: National Security Advisory Board
NSC	: National Security Council
NSFC	: Naval Strategic Force Command
NSSP	: Next Steps in the Strategic Partnership
NAM	: Non-Aligned Movement
NATO	: North Atlantic Treaty Organisation
SSBNs	: Nuclear-Armed Submarines
NCA	: Nuclear Command Authority
NPT	: Nuclear Non-Proliferation Treaty
SSN	: Nuclear-Powered Attack Submarine
NSG	: Nuclear Suppliers Group
NNWS	: Non-Nuclear-Weapon States
NWS	: Nuclear Weapon States
OVL	: Oil and Natural Gas Corporation Videsh
OBOR	: One Belt One Road
PAEC	: Pakistan Atomic Energy Commission
PAC-2	: Patriot (Phased Array Tracking Intercept of Target) Advanced Capability
PNE	: Peaceful Nuclear Explosion
PLA	: People's Liberation Army

AWACS	:	Phalcon Airborne Warning and Control System
PRP	:	Plutonium Recycle Project
PAD	:	Prithvi air-defence
RSS	:	Rashtriya Swayamsevak Sangh
RgPu	:	Reactor-Grade Plutonium
RevCon	:	Review Conference
RMA	:	Revolution in Military Affairs
SWU/y	:	Separative Work Units a year
SLOCs	:	Sea Lines of Communication
SCOMET	:	Special Chemicals, Organisms, Materials, Equipment and Technologies
SFC	:	Strategic Forces Command
SPD	:	Strategic Plans Division
SLBM	:	Submarine-Launched Ballistic Missile
SLCM	:	Submarine-Launched Nuclear Cruise Missile
SAM	:	Surface-to-Air Missiles
TNW	:	Tactical Nuclear Weapon
UK	:	United Kingdom
UN	:	United Nations
UNGA	:	United Nations General Assembly
UNSC	:	United Nations Security Council
UPA	:	United Progressive Alliance
US	:	United States
AECA	:	US Arms Control Export Act
WgPu	:	Weapons-Grade Plutonium
WMD	:	Weapons of Mass Destruction
WFP	:	World Food Programme

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Introduction

As India continues to rise in the international system, its foreign and security policy approaches will attain greater significance in shaping the regional and global security environment. These will also frame how India is perceived by its citizens, global partners and adversaries as an international actor. A central element of India's external policy approaches, and one which has long been domestically viewed as an essential expression of Indian identity in global politics, is its nuclear policy. This nuclear policy encompasses both India's attitudes toward its own nuclear weapons possession and toward restricting global nuclear proliferation. India's nuclear journey was a long one; it had debated and discussed the option of going nuclear for almost four decades, and had therefore earned the distinction of being a 'reluctant nuclear power'.¹ Two decades after it declared itself a nuclear weapons state, today India faces multiple technical, strategic and political challenges, as well as opportunities related to its nuclear policy. Four factors complicate India's nuclear policy matrix.

First, Asia is witnessing a nuclear transition, which many have also called the 'second nuclear age'.² This nuclear age is distinct from the Cold War in many ways. The 1998 nuclear tests broke the Cold War monopoly of the accepted nuclear powers as enshrined in the Nuclear Non-Proliferation Treaty (NPT), a process which started in 1965, was negotiated in 1968, and came into effect in 1970. Unlike the Cold War, where the two superpowers spearheaded the global nuclear race, the current nuclear transition is manifested in a number of states going nuclear. This n-player game has consequences not only for global nuclear proliferation, but also for strategic stability. Further, this nuclear transition is not taking place in a vacuum; a complex web of institutions, organisations and treaties, collectively called the global nuclear non-proliferation regime, channel state behaviour in the second nuclear age. Moreover, these new nuclear states do not behave in accordance with the rulebooks of the Cold war.

States like Pakistan and North Korea, for example, have used nuclear deterrence to undertake ever riskier foreign and military policies. If deterrence induced caution among superpowers, the same cannot be said for some new nuclear powers. India's nuclear behaviour will therefore be continuously influenced by how this transition unfolds.

Second, India is a unique nuclear power insofar as it is surrounded by two hostile nuclear neighbours: China and Pakistan. If security concerns vis-à-vis these countries had been the principal reason for India to go nuclear, their nuclear profiles have transformed substantially in the past two decades. India has very distinct nuclear deterrence requirements against these two countries, which translates into additional pressure on India's nuclear forces and deterrent strategies. How India is coping with the transformation in the nuclear capabilities of its principal adversaries is therefore a matter of immense curiosity.

Third, India's nuclear profile has altered dramatically in the past two decades. With the Agni-V missile, it has achieved an intercontinental ballistic missile (ICBM) capability. It is close to operationalising sea-based deterrence, with its nuclear-powered submarines presently undergoing sea trials. Its ballistic missile defence (BMD) programme is at an advanced stage of technological development. Yet, how these technological achievements will be assimilated in India's nuclear force posture and doctrine has remained an area of speculation.

Fourth, post-1998, India has actively pursued accommodation in the global nuclear regime. With the 2008 Indo-United States (US) Civilian Nuclear Agreement, it has managed to integrate itself with the global nuclear non-proliferation regime, though only partially. It remains outside the Nuclear Suppliers Group (NSG) technology control regime, and is actively lobbying to be granted membership. This integration in the global nuclear regime has created both opportunities and challenges for India's nuclear policy. On the one hand, it has normalised India's nuclear status as a *de facto* nuclear power; on the other, India has also incurred additional responsibilities in areas of export controls and arms control. India's integration into the global nuclear non-proliferation regime is therefore an important variable in its nuclear policies.

India's responses to these nuclear policy challenges constitute the core focus of this book. This study delivers a clear assessment of the contextual landscape within which Indian nuclear policy presently operates, investigating and clarifying the core factors that shape this

landscape. These include new Indian nuclear force posturing opportunities brought by technical force advancements, at a time when nuclear policy governance structures are still being actively constructed. Another factor is the evolution of nuclear doctrinal debates and posturing intentions within India, Pakistan and China. As we will see, there are growing disjunctures in these doctrinal debates, with a resultant threat of crisis escalation due to deepening misperceptions. An additional development is the emergence of new generations of Indian, Chinese and Pakistan land-based nuclear and conventional force projection, amidst aggressive supporting trends in strategic thought. We also see an extension of their nuclear competition, which joins their growing and tense conventional competition in the naval domain. A further complicating element of this context is the striking absence of trilateral strategic dialogue to reduce misperceptions and related tensions. Finally, the nature of contemporary global non-proliferation challenges poses difficult choices for Indian foreign policy in the twenty-first century.

The book investigates these challenges for Indian policymakers in detail. However, it also contributes to academic understandings of nuclear deterrence, the conventional–nuclear threshold and misperception in nuclear strategy. In particular, it builds upon our theoretical understanding of the dynamics that can lead to unplanned escalation. The theoretical focus and overall arguments of the book are outlined below.

INADVERTENT ESCALATION

In his landmark work on escalation, *Inadvertent Escalation: Conventional War and Nuclear Risks* (1991), Posen argued that there are two primary routes to escalation in conflict: planned and unplanned. Planned escalation is a conscious decision by fully-informed policymakers to expand the force commitments, geographic expanse, or political stakes of a given conflict. Unplanned escalation, however, was the focus of Posen's work, and involved scenarios when escalation occurs, and occurs in forms unanticipated by one or more parties to a conflict.

Posen looked particularly at what he termed 'inadvertent escalation': conventional attacks on the nuclear forces or infrastructure of an adversary force. These attacks could threaten adversary confidence in its ability to marshal nuclear defences if needed, and thus introduce nuclear weapons,

even if only in terms of adversary military thinking, into the subsequent conflict.³ This study established three principal causes of inadvertent escalation: the natural offensive preferences of militaries; the security dilemma problem of assuming adversary actions as intentionally escalatory; and 'fog of war' challenges of operating with incomplete information. Posen proceeded to identify inadvertent escalation risks in US–Soviet posturing and strategic thought.⁴

However, applications of this concept to the South Asian context, and especially to the India–China–Pakistan triangular nuclear competition, remain limited. Rehman has investigated these dangers with regard to contemporary Indian and Pakistani intentions to field nuclear-armed naval forces.⁵ These works are limited to this bilateral naval environment, and only briefly discuss China in the context of its role in supporting Pakistan's nuclear force development. In other contributions, Khan and Chari separately apply Posen's inadvertent escalation pathways to study the risks emerging from Indo-Pakistani competition in land and air domains.⁶

While scholarly research on the India–Pakistan bilateral context thus evidences some employment of the inadvertent escalation concept, the literature on Sino-Indian strategic competition has especially awaited substantial research on this theme. Kemburi briefly outlines some dual-use perceptual challenges of cruise missile platforms in India and China, but does not extend this into a systematic analysis of unplanned escalation risks in their nuclear rivalry.⁷ Recent works by Sahgal and Tellis on contemporary Sino-Indian force balances also do not consider factors relevant to unplanned escalation dynamics.⁸

Indeed, broader contemporary surveys of Chinese and Indian strategic thought and planning similarly do not focus specifically on inadvertent escalation risks. Nevertheless, they reveal developments that illustrate the necessity of a study on this topic. For example, Liping briefly notes the presence of a debate within China regarding the potential review of its no-first-use (only using nuclear weapons in response to a first adversary nuclear attack) policy in the event of a conventional attack on its nuclear forces.⁹ In his exploration of current Indian nuclear perceptual and planning issues, Narang highlights that inadvertent escalation could obtain from the aggressive adversary missile targetting intentions of Indian commanders. However, this point forms a limited observation, and the full scope of potential regional inadvertent escalation risks is not the primary focus of his study.¹⁰

The academic literature therefore lacks a significant analysis of potential inadvertent escalation dangers emanating from the contemporary trilateral South Asian strategic competition. However, as this study finds, three principal factors generate conditions conducive to inadvertent escalation in nuclear South Asia.

The first is the looming extension of the triad of India–China–Pakistan nuclear competition to the naval domain. India and China are fielding a new generation of nuclear-armed submarines (SSBNs), and will necessarily learn about their operation partly through trial and error.¹¹ Pakistan is seeking its own naval nuclear forces, most likely through commissioning dual-use Chinese submarines. All three states deploy strident maritime practices or doctrines. India has long viewed itself as a primary naval leader in the Indian Ocean, with its most recent Maritime Security Strategy extending its aegis to identify the South and East China Seas as an ‘area of maritime interest’. Pakistan has a tradition of employing high-risk naval manoeuvres to force adversaries to back down, and its general maritime force modernisation employs anti-access/area denial (A2/AD) capabilities. China’s Indian Ocean ambitions include regular submarine forays close to Indian littorals. The true naval nuclear intentions, seaborne deterrent patrol routes, constitution of naval nuclear forces and perception of maritime territorial boundaries to be defended by all three states remain unclear to each other. There is little regional dialogue focused on establishing a mutual understanding of these aspects, or how to manage a contingency in which a conventional boat comes into hostile contact with a nuclear-armed vessel of another state.

The second factor is the rising prominence of potential dual-use platforms in regional nuclear competition. At sea, nuclear weapons can be carried aboard the surface ships and future submarine platforms of all three states. On land, it remains unclear whether Indian conventional missiles, such as the Prahaar, Brahmos and Nirbhay, will be assigned nuclear missions. China prioritises conventional ballistic missiles in its offensive strike planning, including dual-use platforms such as the DF-21.

The third factor is the reported intentions of all three states to conduct early consequential strikes on adversary territory, seize the operational initiative, and force termination on their terms at the very outset of a conflict. Chinese military thinking prioritises substantial conventional ballistic missile strikes on adversary population centres, command-and-control facilities and force concentrations when a conflict starts. Indian

conventional force commanders will reportedly seek to destroy any missile units and launching areas within adversary territory quickly in a conflict; they are also developing plans and capabilities to launch missile barrages similar to those recommended in Chinese thinking. While not a deep conventional strike, Pakistan's plans to field nuclear-armed 60 km-range ballistic missile forces should be added to this discussion in their potential to substantially alter and escalate a regional conflict, even if they are only deployed for signalling purposes. The understanding by all three states of the escalatory significance of these initiatives, as these are likely to be perceived by the adversary, is unclear.

ACCIDENTAL ESCALATION

A second form of unplanned escalation is accidental escalation. This concept is defined by Lin generally as 'when some operational action has direct effects that are unintended by those who ordered them'.¹² This concept can be differentiated from inadvertent escalation by its accordence of greater comparative weight to the perceptions of political leadership and its surrounding security community, rather than operational military forces, as a driver of unplanned escalation.

The first regional factor conducive to accidental escalation is the near-absence of strategic dialogue among India, China and Pakistan. Dialogues, where they occur, are on a bilateral (India-Pakistan, India-China, or China-Pakistan) basis, intermittent, and often do not involve nuclear policy discussions. Opportunities for misperception, and for planning nuclear forces on worst-case scenarios of adversary nuclear intentions, are growing. These are driven by the lack of a clear understanding of mutual doctrinal and force posturing intentions, combined with a similar lack of understanding regarding conventional territorial and conflict threshold red lines. To give an example of the current levels of regional mutual nuclear understanding, Pakistan doubts the reality of India's declared no-first-use policy; India doubts the applicability of China's no-first-use policy to conventional conflicts involving India; and China refuses to even recognise India as a state that possesses nuclear weapons.

This absence of strategic dialogue amplifies the above opportunities for inadvertent escalation flowing from the merging of nuclear with naval competition; the rising prominence of dual-use capabilities; and shared

regional interests in issuing a devastating offensive strike to settle a conflict early, without developing an understanding of how an adversary would perceive and respond to this strike. The second driver of accidental escalation risk constitutes new developments in nuclear posturing and doctrinal debates within all three states. Indian nuclear doctrine, which has been unchanged since 2003, includes policies of no-first-use and 'massive retaliation' to adversary first-use (defensive use of nuclear weapons in the battlefield). Early views of a force posture characterised by 'minimum deterrence'—ensuring the ability to respond to adversary nuclear use with the smallest possible nuclear forces in numerical size and destructive capacity—are being increasingly challenged by calls for an emphasis on credibility as the organising concept. Arguments in this vein are variously calling for, among other recommendations, an end to the no-first-use commitment and a larger and more technically diverse nuclear force. While the 2003 doctrine remains unrevised despite these pressures, new technical capabilities in the context of this debate and in the absence of a new public Indian nuclear doctrine suggest a certain level of Indian strategic interest in counterforce—(warfighting)—capabilities. These include the declared interest of India's defence scientific agency, Defence Research and Development Organisation (DRDO), in fielding multiple-warhead nuclear missiles, and potential nuclear-capable missiles such as the ballistic Prahaar or cruise Brahmos and Nirbhay platforms. The growing ambiguity, at least in the academic and policy debates, regarding India's ultimate nuclear intentions—which would be best settled by a public official defence review—generates opportunities for adversaries to misperceive what these are.

Pakistan reportedly builds Indian fissile material stocks, both from civil and military nuclear energy programmes, into its force sizing plans, despite Indian claims that the two programmes are completely separate. Pakistan is also currently replacing its nuclear organising concept, previously 'credible minimum deterrence', with one of 'full spectrum deterrence'. While the first-use policy of Islamabad remains intact, 'full spectrum deterrence' intends to field a specialised nuclear force capability for every potential rung of conflict with India. This would dramatically lower the bilateral nuclear threshold, so that it would essentially exclude any conventional conflict from possessing nuclear implications, freezing most uses of India's conventional superiority (as the existence of this superiority is perceived by Islamabad) for fear of nuclear escalation. This

new concept is best symbolised by the 60 km-range Nasr nuclear ballistic missile, intended to escalate local Indian conventional attacks to the nuclear level, and thus deter them. Pakistan's nuclear threshold red lines remain ambiguous, sketched in various scenarios of substantial maritime, land, economic or conventional force losses. It remains generally unclear, even to well-informed Pakistan analysts, how much general conventional damage Pakistan will tolerate before considering first-use.

India refuses to accept 'full spectrum deterrence' and what the Nasr represents in its force planning: a clear example of a deliberate decision to adopt, if not a misperception of Pakistan nuclear intentions, certainly a different perception to the intentions declared by Islamabad. In line with this thinking, Indian conventional force commanders continue to focus on training exercises to enable the military to fight through nuclear use, signalling to Pakistan that New Delhi will be undeterred by use of the Nasr in pursuit of wartime objectives. Pakistan, by contrast, continues to claim that full spectrum deterrence will deter Indian conventional attacks on Pakistan. As Krepon has previously argued, only one state can be correct.¹³

China's nuclear doctrine emphasises no-first-use and a more stringent form of 'minimum deterrence' than India's concept of 'credible minimum deterrence'. However, there is a similar growing ambiguity regarding its nuclear and conventional intentions. As part of wide-ranging military reforms announced in December 2015, Beijing is reorganising all land-based conventional and nuclear missile forces under a single Rocket Force and merging its previous two India-facing military commands into one Western command, with a more aggressive operational concept.¹⁴ Other than the aforementioned nuclear-armed submarine fleet, China is also introducing a new generation of more precise, multiple-warhead and more mobile ground nuclear forces. Chinese nuclear missile testing since January 2016 has particularly featured conditions similar to those of missile bases with India-targeting missions; and recent strategic discourse suggests that Chinese commanders could see adversary conventional attacks on nuclear-capable units, as is reportedly promised by Indian conventional force commanders, as amounting to nuclear first-use: the classic Posen scenario of inadvertent escalation.

The present South Asian nuclear context therefore offers fertile ground for deepening our theoretical understanding of escalatory pressures, as well as of the potential consequences of ambiguous nuclear doctrines and force planning intentions in generating regional instability. This book

highlights how the interacting nuclear doctrines and evolving postures of India, China and Pakistan, in a near-absence of effective strategic dialogue, are creating new conditions conducive to potential inadvertent and accidental escalation.

RECOMMENDATIONS

As well as elucidating these dynamics and developing the literature on unplanned escalation, this book also makes two policy recommendations. First, we propose that New Delhi, Beijing and Islamabad initiate nuclear and naval strategic dialogues to discern mutual nuclear and territorial intentions, and thus reduce the risk of conflict emerging from misperception. This would serve as a worthy risk-reduction and confidence-building initiative in light of the multiple interlocking challenges that this book identifies. These challenges include: growing ambiguity in regional nuclear intentions arising from new debates on nuclear doctrine; the fielding of a new generation of nuclear forces; the multiple technical posturing and doctrinal options presented by new, potentially dual-use ballistic missiles, naval and air platforms; and the opportunities for adversary misperception of ultimate nuclear intentions, and risk of unplanned nuclear escalation, within this context.

Convening such regular dialogues would especially help nuclear risk-reduction efforts in preventing the risk of misperception of a conventional for a nuclear mission, or vice versa, as one of the core emerging concerns in both the land and sea domains. As the nuclear forces of all three countries—India, Pakistan and China—may come into increasing direct contact through the prospect of naval nuclear-armed fleets, institutionalising the practice of trilateral nuclear dialogue can prove a worthy endeavour to prevent a nuclear crisis, or reduce tensions if such a crisis occurs.

To fully integrate this complex and evolving regional strategic context into Indian defence planning, our second recommendation is that a public Indian official defence review should be conducted. This would include an assessment of its rapidly shifting regional environment to inform conventional and nuclear force planning. In exploring these conditions, the review should lead to the adoption of a posturing response that clearly separates conventional from nuclear threats, and assigns response

packages to conventional and nuclear forces, respectively. The latter exercise should reiterate that Indian nuclear forces only obtain credibility as a tool of last resort, and should be thought of solely in the minimum terms of deterring specifically nuclear threats. Stronger conventional defences and renewed effort to building these should form the Indian response to non-nuclear threats.

As well as disaggregating and prioritising the specific regional threats posed to Indian security, and generating a more efficient use and development of defence resources in response, such a process would reduce the capability-led and doctrine-led ambiguity regarding nuclear thresholds that we have seen emerging above. It will also help India to address political and technical questions regarding its nuclear force capabilities that influence its stances toward the Comprehensive Test Ban Treaty (CTBT) and Fissile Material Cut-off Treaty (FMCT) process, as we will see in Chapter 6, which studies Indian non-proliferation policy approaches.

CHAPTER SUMMARIES

This book will explore technical advancements in the Indian nuclear force; the nuclear doctrinal evolution and force developments of Pakistan and China; the history and present contours of Indian nuclear thought; and India's approach to global non-proliferation policy.

Chapter 1 investigates India's technical nuclear force development, and finds that India's nuclear force in 2018 is scaling new heights of technical achievement at an unprecedented rate. Progress in delivery vehicles is seemingly constrained only by present limits in technical knowledge. India today stands on the brink of possessing ICBMs, a potential new generation of short-range, nuclear-capable missiles, and a seaborne nuclear-armed submarine fleet. While some measures of restraint are in place, such as the testing moratorium practised since 1998, the wide scope and ambition of nuclear force development is increasingly difficult to reconcile with India's stated nuclear posture of 'credible minimum deterrence'.

Chapters 2 and 3 investigate in detail the Indian nuclear doctrinal and force pressures posed by Pakistan and China. Both states are modernising their nuclear forces, and honing the nuclear and conventional threats they pose to India, albeit in different ways. These chapters particularly highlight

that, in the land and emerging naval domains, there is a growing blurring of conventional and nuclear thresholds, as states harbour different ideas about where these thresholds are and where they should be. A second notable form of this blurring is in the growing prominence of dual-use platforms and the resultant difficulty of discerning the conventional or nuclear mission of an adversary force concentration. Without the establishment of a trilateral nuclear and defence dialogue, the above factors conducive to accidental and inadvertent escalation are likely to further develop.

Chapters 4 and 5 explore India's nuclear doctrinal debate, from 1964 till the present. It argues that there has been a gradual transition from early near-universal policymaker and expert support for 'minimum deterrence', toward a growing interest in establishing the technical credibility of the nuclear force rather than its continued 'minimum' status. This has been reflected in differences between the 1999 and 2003 Indian nuclear doctrines, as well as in the tenor of current doctrinal debates. Indian nuclear planners are approaching a juncture where they must decide, in a worsening regional strategic context, how to balance the continued substantial support for 'minimum deterrence' with rising pressures to elevate the role of nuclear weapons in Indian defence.

Finally, Chapter 6 outlines India's approach to global non-proliferation policy. It finds that India has long been dedicated to policies to limit external proliferation, but has traditionally conditioned the scope of its efforts upon an overarching view of broader national interests, such as the perceived need to retain nuclear weapons capability. It finds that India has long been dedicated to policies to limit external proliferation, but has traditionally conditioned the scope of its efforts upon an overarching view of broader national interests, which preclude fully cutting ties with a state of proliferation concern. This approach has also involved a willingness to develop and enforce non-proliferation policies unilaterally, rather than through many of the principal international non-proliferation regime structures. Although India has had a unique record of non-proliferation policy history and engagement with the above structures, this balancing of non-proliferation policy objectives with broader strategic interests explains much of this trajectory, and continues to characterise India's approach today. Political and technical questions regarding nuclear force size and reliability continue to affect current Indian debates on the CTBT and FMCT process, highlighting again the need for an official defence review.

We will now turn to survey Indian technical nuclear force development as it stands in 2018 and explore the questions that these projects raise for Indian defence planners, and also look at how India's nuclear force acts in its regional context.

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10. Narang, 'Five Myths about India's Nuclear Posture', p. 151.

11. SSBN is the technical term used for nuclear-armed submarine. The SS stands for submersible ship, or submarine; the B for ballistic missile; and the N for nuclear-powered.

12. Herbert Lin, 'Escalation Dynamics and Conflict Termination in Cyberspace', *Strategic Studies Quarterly*, vol. 6, no. 3 (Fall 2012), p. 53.

13. Krepon, 'Stability-Instability Paradox', p. 16.

14. The PLA Rocket Force is responsible for the management and employment of China's conventional medium-range and long-range ballistic missiles, and nuclear missiles. Under the 2016–17 Chinese military reforms, the Rocket Force is treated as an independent service at the same level as the Army, Navy and Air Force. Military theater commands must formally request the use of Rocket Force assets, rather than these being under the normal control of each of these regional commands. Nuclear use by the Rocket Force can only be authorised by the Central Military Commission in Beijing.

Indian Nuclear Force Development in 2018¹

After India conducted a series of nuclear weapons tests in 1998, many prognosticated a grim future for India's nuclear forces and its status as a nuclear weapon state. Claims were made of India being a 'third tier nuclear state' and 'a low level nuclear power'.² Doubts were raised about India's capabilities to expand its nuclear arsenal, as well as its intentions to be counted as a major nuclear power in the world. In fact, India's slow drive towards weaponisation was conflated with its limited capabilities. Given India's still nascent nuclear arsenal, compared to the technological sophistication and doctrinal clarity that other nuclear powers had achieved, it was also suggested that India would not command the same respect as the other major nuclear powers.³ Forecasts were made that Pakistan would remain the singular focus of India's nuclear forces, and hence, India's nuclear deterrent would at best be confined to the South Asian region.⁴ The reasons behind such assumptions were mainly material: shortage of fissile material, technological incapacity to produce reliable delivery systems, ineffective bureaucratic structures (especially of its scientific enclave), and rudimentary command-and-control systems. Progress on these components was assumed to be severely restricted by India's dire economic health and the necessity to cater to the more important demands of the Indian democracy: the need for economic development and reduction of the chronic poverty which formed the dark underbelly of a nuclear India. Also, the hostile international reaction to India's overt nuclearisation threatened to restrict, or even punish, Indian efforts to further develop its nuclear capabilities.

Another argument made was that nuclear force development would proceed at a slow pace for moral reasons. While addressing an attentive audience at the India International Centre just after the nuclear tests, India's foremost strategic thinker, K. Subrahmanyam, claimed:

... nuclear weapons is not the issue ... it is a question of India's dignity and sovereignty. India has the right to be equal with any other major power of the world because it represents one sixth of humanity and that is the issue, because a nuclear weapon is not a weapon of war.⁵

Such post facto reasoning, especially coming from the centre of *realpolitik* thinking (realist, power-centric approaches) in India, made India's aspirations for nuclear status appear as mere symbolism—all rhetoric, no substance—further validating the assumption that India has neither the intentions nor the will to expand its nuclear forces. Subrahmanyam also made a number of other claims: for projecting effective deterrence, only a few nuclear weapons will suffice;⁶ having managed to enter the 'mainstream paradigm' of nuclear weapon states (NWS), India can now pursue effective disarmament to 'change the paradigm itself',⁷ that on the 'basis of a perception of mutual deterrence', India and Pakistan will now have peace;⁸ and that India can now sign the CTBT and vouch for a nuclear weapons convention.⁹

Beyond these material and moralistic rationales for a rudimentary nuclear force, cultural notions of India being a different kind of nuclear power, compared to the expansionist streak of Cold War warriors, further supported the impression that India's force development would be haltingly slow.¹⁰ India's strategic restraint in its past conflicts and its abhorrence for the use of nuclear weapons were often cited as proof that force development would not gain a lot of momentum. The limited use of force during the Kargil War provided further boost to the idea that even small nuclear forces can deter states from escalating the conflict, whether it was Pakistan or India who did the escalating. And therefore, India's nuclear forces would not see a major accretion.

INDIAN NUCLEAR FORCES IN 2018: OVERVIEW

Twenty years hence, the trajectory of India as a nuclear weapons state is drastically different compared to the initial pictures painted by many in the aftermath of the nuclear tests in 1998. Many of these assumptions have been undermined, whether concerning the growing instability in Indo-Pakistan relations, the shift in focus of India's nuclear forces from

Pakistan to China, or the shallow treatment that disarmament receives in India's current nuclear politics. However, what is most glaringly conspicuous in India's trajectory as a nuclear weapons state in the past 20 years is the progress in technical force development and the expansion of its nuclear arsenal.

Today, India boasts an expanding nuclear portfolio designed to extend beyond South Asia. Indeed, the ambitious aspirations of India's nuclear weapons designers today invite questions as to the existence of political limits guiding the programme. The emerging structure of the nuclear force, on its current trajectory, appears to be leading away from its stated posture concepts of 'credible minimum deterrence' and 'assured retaliation', which are based upon ensuring a minimum deterrent able to guarantee retaliation to nuclear first-use by China or Pakistan.

Instead, recent development projects, such as multiple independently targetable re-entry vehicle (MIRV) warheads, the 700 km-range Shourya nuclear missile, and the potentially nuclear-capable, short-range Prahaar, Brahmos and Nirbhay missiles, become suggestive of Indian interest in a warfighting capacity. There is growing pressure within India for the government to include warfighting options in its nuclear approach, and a retired Army officer and nuclear expert has argued that the advent of the Shourya and Prahaar 'confer a warfighting capability'.¹¹ Even if these missiles are assigned solely conventional missions, they would still enable an enhanced Indian capability to launch conventional counterforce strikes. Such emerging elements of the Indian nuclear discourse were also revealed, as will be discussed in detail later, in the memoirs by a former National Security Advisor (NSA) that suggest potential Indian interest in counterforce targetting, including even pre-emptive counterforce strikes.¹²

India is advancing in all aspects of the development of its technical nuclear capabilities. Ballistic missiles of an ever-greater range are being planned and unveiled, while its long-awaited nuclear-armed submarine fleet is finally taking operational form with the launch of the INS Arihant. As well as these major platforms, more subtle improvements are also being made in supporting infrastructure. The Defence Research and Development Organisation (DRDO), the organisation responsible for missile development, is working on warhead miniaturisation; this could lead to a tactical nuclear weapons (TNW) capability. The Department of Atomic Energy (DAE) is up-scaling its uranium enrichment capabilities,

which could accelerate India's fissile material production. A sense of momentous and fast-moving technical progress is therefore in the air.

India's land-based ballistic missile portfolio attracts most of the public limelight. From hosting just three platforms in 1998—the Prithvi, the Agni-I and the Agni-II—limited in range to targets in Pakistan, today New Delhi is building the Agni-V, which will be able to reach all targets in China, and also working on the Agni-VI, intended to extend even further. The missiles enjoy a certain patriotic symbolism, with each successive unveiling of a new platform attracting celebratory statements from the Prime Minister's Office and favourable coverage in the Indian media. However, there are questions concerning the governance of this missile programme: no upper limit appears to have been set for India's missile aspirations by its political masters, and the operational credibility of these new missiles is doubtful, given their limited DRDO testing programme before entry into service. Despite the reported formation of several combined civil-military nuclear planning cells in the last decade, the persistence of these issues raises concerns regarding the correspondence of the missile programme with Indian strategic intentions.

The air-based leg of India's emerging nuclear triad has not changed dramatically since 1998, and is still the most reliable of the three legs. The platform relies upon nuclear gravity bombs dropped by the Jaguar IS/IB and Mirage 2000H aircraft. Additional aircraft currently under Indian procurement, such as the Sukhoi Su-30 MKI and Rafale, are also nuclear-capable and could serve a future role in India's nuclear force. As the full induction of new land-based and sea-based platforms will likely take decades, the Indian Air Force (IAF) will continue to serve as the backbone of India's nuclear force in the medium term.

India's sea-based platforms, the least operationalised of the three triad legs, are still mainly theoretical. The Arihant, the flagship of India's indigenous nuclear-armed submarine fleet, is currently out for sea trials. Indian sailors are gaining the operational knowledge of managing a nuclear submarine through trialling the Akula, a nuclear attack submarine lent by Russia. The K-15 and K-4 seaborne missiles to be hosted on the Arihant-class SSBN fleet are still under development, and the highly limited range of the former suggests that further work is needed before a satisfactory SSBN force is ready.

While efforts continue to operationalise these three elements of the triad, India is also developing a BMD system. Combining radar

technology acquired through international cooperation with interceptor units developed as offshoots of the Indian missile programme, the DRDO announced in 2011 that a limited BMD capability would be fielded around New Delhi and Mumbai by early 2014. This has not been delivered, and there has been no updated official time estimate since then.¹³ Similar to the latter Agni platforms, the claims of the DRDO about the operational credibility of this system should thus be viewed with some scepticism. The emergence of a BMD system highlights the same concerns, as does the Agni portfolio. These revolve around the question of the degree to which these projects are conceived, directed and monitored by the Prime Minister's Office, the Strategic Forces Command (SFC), and the Ministry of Defence (MoD) in accordance with a pre-existing strategic doctrine; or, instead, conceived and developed by a more autonomous Indian defence scientific establishment with looser central political and technical oversight.

These new systems will impact India's great rising power profile and relationships with its key allies and adversaries, further elevating the salience of the governance questions they raise. In analysing the progress and credibility of the nuclear capabilities being presently developed, a recurrent concern is the direction in which India's nuclear force could be heading, as signposted by these emerging capabilities. A strategic defence review, which must include a new assessment of the role of nuclear weapons and current nuclear force projects in the context of India's wider defence posture, is needed.

This chapter seeks to provide an empirical analysis of India's technical force development trajectory. This will provide the technical background against which the broader Indian doctrinal debate, to be discussed in Chapters 4 and 5, is conducted. This chapter seeks to answer the questions: What does the Indian nuclear force, both present and envisioned, look like in 2018? What are the technological and governance issues shaping the nuclear force? A consideration of the broader political debates and the regional context of the Indian nuclear force will be provided in subsequent chapters.

INDIA'S NUCLEAR WARHEADS AND FISSILE MATERIAL CAPABILITIES

India is presently estimated to hold between 90 to 120 nuclear warheads, a weapons-grade plutonium (WgPu) stockpile of 540 kg (enough for

around 110 bombs) and a highly-enriched uranium stockpile of 800 kg (enough for around 50 bombs).¹⁴ This estimate can be taken as a minimum against a more ambitious assessment by R. Rajaraman. According to his assessment, India has more than 600 kg of WgPu and more than 1,300 kg of reactor-grade plutonium (RgPu).¹⁵ However, given that one of the nuclear devices in the 1998 tests was based on RgPu, and one warhead would use 5–7 kg of fissile material, India, in theory, sits on top of a potential nuclear arsenal comparable to that of China: something close to a capability of 300–50 nuclear warheads.

The two main WgPu producing reactors have been CIRUS and DHRUVA. Whereas CIRUS (decommissioned in December 2010) had a capacity of generating 40 Mega Watt Thermal (MwTh) and was commissioned in the year 1963, DHRUVA started producing WgPu since 1988 and runs at 100 MwTh.¹⁶ According to a 2008 estimate by R. Rajaraman, if both CIRUS and DHRUVA were operated at an average capacity of 70 per cent, the yearly WgPu produced by these two reactors would be 9 kg and 22 kg, respectively.¹⁷ According to Rajaraman, by 2008, CIRUS had produced close to 342 kg (except for the period 1997–2003, when it was closed for refurbishing) and DHRUVA had produced 437 kg of WgPu, bringing India's total WgPu stocks to 779 kg. Given that close to 131 kg of fissile material was consumed during India's nuclear tests and its preparations, India's nuclear warhead inventory consisted of approximately 648 kg of fissile materials as of 2008.¹⁸

India also has a huge inventory of reactor grade plutonium (RgPu). Its pressurised heavy water reactors or CANDU-type reactors are ideal for producing spent fuel which is rich in plutonium Pu-239, but which is accompanied by a number of plutonium isotopes such as Pu-240, Pu-241 and Pu-242.¹⁹ The presence of these isotopes render RgPu inefficient for weapon design, as their radioactive decay life is considerably smaller, thus making them unsuitable for weapons purposes. However, it is possible to fabricate low yield nuclear fission devices based on RgPu.²⁰ In fact, it has been widely reported that one of the tests conducted during 1998 was based on RgPu.²¹ India has an RgPu inventory of around 13 tons.²² However, India's annual RgPu production from CANDU reactors would eventually come down from 2 tons in 2009 to 1.14 tons by 2014, with more and more reactors coming under safeguards under the US–India nuclear deal.²³

Under this deal, India has agreed to put some of its CANDU-type reactors under safeguards. Of the 22 CANDU-type reactors currently in operation,

India plans to only safeguard 14, keeping eight of them without any international oversight and possibly for military purposes.²⁴ These reactors would continue producing unsafeguarded RgPu. Also, the RgPu accumulated before the deal came into effect would not come under safeguards. India, if the need arises, can use this inventory of RgPu for weapons purposes, as it had done with one of the devices during the 1998 tests.

India is also working towards its fast breeder reactor (FBR) programme. If this programme is ultimately successful, a single breeder reactor of the kind being currently constructed at Kalpakkam would generate more than 140 kg of plutonium with a fissile content of more than 95 per cent annually.²⁵ India has not officially rejected the use of the FBR programme for its strategic needs. During the tense negotiations on the Indo-US nuclear deal, the DAE strongly fought to keep the FBR programme outside of the International Atomic Energy Agency (IAEA) purview. Anil Kadkodkar, the then chairman of the DAE, claimed that the FBRs are not only important for India's energy security, but also for its 'strategic' (possibly weapons) needs.²⁶

In addition, India has two gas centrifuge highly enriched uranium (HEU) producing facilities, in Bombay and Rattehalli.²⁷ Its uranium enrichment programme has grown in both quality and quantity in the last decade.²⁸ Commissioned in the year 1990, the Rare Materials Project at Rattehalli caters to the fuel needs of India's nuclear submarine project, producing 20–40 per cent enriched uranium.²⁹ However, reports suggest that some of this HEU was also used in the 1998 nuclear weapons tests.³⁰

According to Albright and Basu, India has both enlarged its centrifuge capability and also added to the sophistication of its centrifuge technology. As per their report, which came out in 2006, India runs 2,000–3,000 centrifuges with a capacity of 9,600 SWU/y, enough to produce 48 kg of 90 per cent HEU annually.³¹ However, a paper by another analyst suggests a much more conservative figure. According to M. V. Ramana, the enrichment capacity of the Rattehalli enrichment plant is approximately 4,500 SWU/y, capable of producing only 22 kg of 90 per cent HEU, and 40–70 kg of 45 per cent enriched uranium.³² At the other extreme, a more recent analysis by former IAEA inspector Robert Kelley surveys the new construction at Rattehalli to suggest a total capacity of 42,000 Separative Work Units a year (SWU/y), and around 183 kg of weapons-grade uranium. This latter assessment is calculated by assuming the efficient operation of a new generation of centrifuges.³³ A third enrichment facility at Challakere is also presently being built, although its intended output levels are unclear.³⁴

The above discussion on fissile material capability does suggest more than a modest inventory of fissile material stocks. However, two factors must be taken into account. First, historically speaking, even when India had huge stocks of fissile material, it has always been conservative in using it for weapons purposes. As Rajesh Rajagopalan has argued, 'The small size of the Indian nuclear force is the consequence of deliberate choice rather than because of any fissile material shortage.'³⁵ If India's intentions on the number of weapons are modest, the technical requirements of India's three-stage energy programme, which includes breeder reactors, necessitate a high inventory of fissile material.³⁶ As far as its uranium enrichment programme is concerned, it is primarily geared towards the production of fuel for its nuclear submarine programme.

INDIAN NUCLEAR DELIVERY VEHICLES

Details of India's current nuclear delivery vehicles, both inducted and developing, are provided in Table 1.1. As we can see, these delivery vehicles are diversifying, rendering the overall trajectory of Indian nuclear force development—towards a limited reliable triad supporting a posture of assured retaliation, or towards a diversified posture more suggestive of warfighting capabilities—less clear to discern. The range of nuclear force development projects, combined with the uncertain degree of central political and technical oversight to shape their development in accordance with a strategic doctrine, merits a strategic defence review to clarify India's nuclear posture and force development objectives in line with national defence goals.

Table 1.1: Indian Nuclear Forces in 2018³⁷

Type	Range (km)	Payload (kg)	Current Status
Land-based Missiles			
Prithvi-I	150	1,000	Deployed with Army 333rd and 355th Missile Groups. Less than 50 launchers believed to be deployed.

(contd.)

(Table 1.1 continued.)

Type	Range (km)	Payload (kg)	Current Status
Agni-I	700	1,000	Deployed with Army 334th Missile Group from 2004. Around 10–20 launchers believed to be deployed.
Agni-II	2,000	1,000	Deployed with Army 335th Missile Group. Around 10 launchers believed to be deployed.
Agni-II +	2,000 +	1,000	Under development.
Agni-III	3,000	1,500	Presently being inducted.
Agni-IV	3,500	1,000	Presently being inducted.
Agni-V	5,000	1,500	Under development.
Agni-VI	6,000	1,500	Under development.
Sea-based Missiles			
Dhanush	350	500	Induction underway but not operational
K-15 (Sagarika)	700	500–600	Development complete; integration with Arihant-class nuclear submarine underway
K-4	3,500	1,000	Under development.
K-5	5,000	N/A	Under development.
Aircraft			
Mirage 2000H	1,800	6,300	Squadron 1 or 7 of 40th Wing, deployed at Gwalior Air Station, is reported to have been assigned a nuclear mission. The Mirage fleet is undergoing capability improvements, adding 20 years to its lifespan, from July 2011.
Jaguar IS/IB	1,600	4,775	Reports suggest two squadrons at Ambala Air Force station are assigned nuclear missions. The Jaguar fleet is undergoing capability improvements, which will extend its lifespan past 2030.

(contd.)

(Table 1.1 continued.)

Type	Range (km)	Payload (kg)	Current Status
MiG-27	1,760	3,500	Some MiG-27s may be assigned nuclear roles. However, safety issues have led to a decision to phase out the MiG-27.
Sukhoi Su-30 MKI	3,000	8,000	The SFC has assigned a nuclear role to 40 Sukhois. India intends a fleet size of 272 planes.
Rafale	3,700	9,525	The Rafale is nuclear-capable, although there is no evidence they will have nuclear roles. India intends a fleet size of at least 36 planes.

LAND-BASED DELIVERY VEHICLES

Indian missile development has overcome substantive barriers caused by financial limitations and external technology sanctions to feature diverse and ambitious projects today. At the time of the 1998 nuclear tests, India possessed a principally Pakistan-centric force, relying upon air-delivered gravity bombs and ballistic missiles with a maximum range of 700 km. Contemporary Indian missile advancements, such as the 5,000 km-range Agni-V and prospective 6,000 km-range Agni-VI, now signify a growing focus on China.³⁸ A former SFC chief recently commented:

It's not Pakistan we are looking at most of the time, like most in the West presume ... Beijing has long managed a thermonuclear program, and so this is one of many options India should push forwards with, as well as reconsidering our nuclear defense posture, which is outdated and ineffective. We have to follow the technological curve. And where China took it, several decades before us, with the hydrogen bomb, India has to follow.³⁹

However, Indian missile development does not merely entail ever-greater size and range extensions. Nor do India's broadening nuclear

aspirations mean that Pakistan is overlooked as a strategic target. A growing interest in short-range missile development threatens new frictions with Pakistan.

India's present missile platforms emanate from the Integrated Guided Missile Development Programme (IGMDP), established in 1983 to organise military projectile development. Initial IGMDP projects included the Prithvi (short-range surface-to-surface), Agni (intermediate-range ballistic), Trishul (short-range surface-to-air), Akash (medium-range surface-to-air) and Nag (anti-tank) missile platforms. Of these platforms, the Prithvi and Agni were intended to be nuclear-capable.⁴⁰

The Prithvi and Agni served as the two operative missile platforms, leading up to India's 1998 nuclear tests. Their limited ranges and positioning near Pakistan indicated the centrality of Pakistan in Indian nuclear and strategic planning in this time period.⁴¹ However, their operable credibility was undermined by the failure of successive Indian governments in the 1990s to subject them to regular tests. Governments feared that conducting launch tests would generate geopolitical tension and accusations of nuclear aggression. The consequent opacity surrounding the number of Prithvi and Agni missiles available, their technical reliability, and their specific attributes reflected the general approach towards opacity in Indian nuclear policy in the 1990s. India would neither confirm nor deny its possession of nuclear weapons, a policy which involved refraining from visible efforts, such as launch tests, to deploy a nuclear arsenal.

The new coalition government, led by the Bharatiya Janata Party (BJP), that entered office in March 1998, initiated a new nuclear policy based upon developing an overt nuclear arsenal. This involved a series of tests in May 1998 (see Table 1.2) of nuclear devices with a range of yields. The tests intended to provide greater technical certainty to Indian nuclear capabilities and symbolise the dawning of a new era of India as a nuclear power.

The series, operated by a joint DRDO–DAE team of scientists, included a single thermonuclear test. The yield from this test was initially reported as meeting the design specifications of 45 kilotons (kt). However, K. Santhanam, a senior DRDO member of the test team, publicly disavowed this stated yield in 2009. He claimed the yield was instead a 'fizzle', or significantly lower than that intended by the test team.⁴² There is no present effort to independently test the credibility of DAE claims regarding

the performance and reliability of their warheads, creating technical doubts that permeate through India's nuclear force development.

Table 1.2: 'Shakti' ('Power') Nuclear Testing Round, May 1998

Date	Identifier	Description
11 May 1998	Shakti-I	Two-stage thermonuclear device with fusion boosted primary; 45 kt yield
11 May 1998	Shakti-II	Lightweight pure fission device; 12 kt yield
11 May 1998	Shakti-III	Experimental pure fission device; 0.3 kt yield
13 May 1998	Shakti-IV	Experimental device; 0.5 kt yield
13 May 1998	Shakti-V	Experimental device; 0.2 kt yield

Source: Nuclear Weapon Archive, 'India's Nuclear Weapons Program: Operation Shakti, 1998'.

Following the tests, the Prithvi and Agni programmes were also accelerated. The Agni-I was formally commissioned in 1999. The government also approved a test of the Agni-II in April 1999, and announced that it would be commissioned in August 1999.⁴³

The DRDO has continued missile research, developing longer-range platforms ranging from the Agni-III to the prospective Agni-VI. As DRDO has every bureaucratic interest in expanding its missile portfolio to acquire greater budget allocations and political prestige, the only limit to Indian missile aspirations at present appears to be at the level of technical knowledge.⁴⁴ A recent DRDO chief, remarking on the potential limits to Indian missile development, has stated that 'DRDO does not wait for the threat to become a reality before it starts the development', and as such it intends to 'develop capabilities to meet futuristic threats'.⁴⁵

The rapid improvements in technical knowledge afforded by the more supportive stance of post-1998 governments towards nuclear force development, plus this seeming tendency of missile-related decisions to move into DRDO operational discretion, could account for the acceleration of the missile programme over the past few years. More recent missile platforms, ranging from the Agni-III to the prospective Agni-VI, have only been subjected to a very small number of tests. While these latest platforms are important for understanding the direction of Indian nuclear force development, their full operational credibility and deployment is still some way off.⁴⁶

These latter missiles, by their ranges and the DRDO remarks attached to them, are more clearly focused on Chinese targets.⁴⁷ This became especially visible in the discourse surrounding the unveiling of the Agni-V (5,000 km-range) missile, as the first missile able to reach Chinese east coast metropolitan targets like Beijing or Shanghai. To further pose a sign of robust intent against potential Chinese aggression, DRDO is reportedly developing MIRV warheads. There are technical doubts about the potential of several existing Agni missile models to host MIRVs without their substantial redesign and the miniaturisation of warheads, but DRDO has nevertheless expressed its intention to pursue this project.⁴⁸ While there is a planning cell in the Nuclear Command Authority (NCA) that makes recommendations vis-à-vis nuclear force structure, no upper ceiling appears to have been set for the Indian missile range and destructive capability.⁴⁹

These large, long-range ballistic missiles attract the greatest media attention, but there are also substantive developments in short-range ballistic and cruise missiles that could impact Indian security and relations with neighbours. These include the Prahaar and Brahmos. The 150 km-range Prahaar ballistic missile is intended to replace the Prithvi nuclear-capable missile. Although flight trials are currently being planned, the potential nuclear mission of the Prahaar is presently unclear.⁵⁰ With a warhead capacity of 200 kilograms (kg), the Prahaar is currently defined by the DRDO as a purely conventional missile. The agency's reasoning for this is that it has merely not yet mastered warhead miniaturisation to smaller than 500 kg, rather than political limitations against fielding tactical nuclear missiles.⁵¹ However, another statement by the then head of DRDO, V. K. Saraswat, confirmed that the Prahaar can host 'different types of warheads', and a retired Indian Army officer has described the missile as providing a nuclear warfighting option.⁵²

An Indian defence analyst has outlined the potential Indian Army thinking behind the development and induction of the Prahaar, with a focus on the missile assuming the burden of local target strikes from the IAF, and permitting the IAF to focus its attention more on deeper strikes within the adversary territory:

During a future round of all-out hostilities (which are likely to be of limited duration, not lasting more than two weeks), the Army wants to reduce as much as possible its traditional reliance on the Indian Air Force (IAF) for close air support and tactical battlespace interdiction during the first 72

hours and wants to acquire its own integral ground-launched firepower assets that are available on demand under all weather conditions. This in turn will free the IAF to realise its larger objective of shaping the multi-theatre battlespace by decapitating the enemy's tactical airpower through relentless offensive air superiority and counter-base air campaigns.⁵³

Another Indian missile platform to be inducted as part of the Indian posture against China is the Brahmos. The Brahmos is a hypersonic cruise missile jointly designed with Russia, with a range of 600 km. The ability of the Brahmos to host nuclear warheads is similarly ambiguous, like that of the Prahaar, although a Russian official has stated that the missile is 'capable of carrying a nuclear warhead'.⁵⁴

The Indian Army plans to induct at least five Brahmos regiments, each consisting of 36 Brahmos missiles, with at least one of these regiments to be stationed in Arunachal Pradesh as part of India's force posturing against China.⁵⁵ A new variant of the Brahmos, the Block-III, is designed with a 'steep-dive' capability that can reach targets on the rear side of a mountain. As well as targetting adversary force concentrations and facilities, an Indian analyst has claimed that this variant is ideal for blocking mountain pathways.⁵⁶ The Block-III is intended for induction into the Mountain Strike Corps.⁵⁷

Indeed, the Chinese media has recently expressed concern regarding the assignment of a Brahmos regiment to the Indian Army's 41st Artillery Division in Arunachal Pradesh, close to the Line of Actual Control (LAC) with China.⁵⁸ Furthermore, a forthcoming Brahmos-II (K) missile is designed to eliminate 'hardened targets such as underground bunkers and weapons storage facilities'.⁵⁹ This latter variant suggests Indian interest in utilising the missile for deep conventional strikes, especially if launched from Sukhoi fighters.

The 1,000 km-range Nirbhay land-, air- and sea-launched cruise missile, however, looks like the most likely of these three platforms to be assigned a nuclear mission. Both the Nirbhay and Brahmos presently employ Russian technology, currently prohibiting their employment as nuclear missiles under the Missile Technology Control Regime (MTCR) restrictions. However, efforts are underway in both the missile programmes to indigenise their technology. While marking a significant advance in the technical sophistication of Indian missiles, full indigenisation would permit their addition to India's nuclear arsenal. India is presently testing a new

domestically developed turbofan engine to replace the Nirbhay's existing engine, which is the last component of the missile to be of foreign origin. The Brahmos programme also features a drive to indigenise its technology, although its more advanced ramjet engine has been presently identified by Indian defence scientists as an obstacle in this regard.⁶⁰

These technical points, however, neither diminish the potential for these three platforms to be assigned nuclear missions in the future, nor the ability of Pakistan and Chinese commanders to nevertheless view them as nuclear-armed, and to misinterpret the nature of their deployment in a crisis. Even if they are attributed solely conventional missions, the Prahaar and Brahmos platforms are well-suited to potential counterforce strike packages, and their deployment or related preparations could be interpreted in this light by adversaries. The Brahmos-II (K) appears especially intended for operations against high-value military targets.

The impending assignment of these missiles to Sukhoi fighters, combined with the nuclear missions attached to these fighters by the SFC, further creates ambiguity around potential Sukhoi missions that could prove dangerous in a crisis. Therefore, the intentions by Indian forces to make greater use of these missiles could substantially blur the threshold between conventional and nuclear conflict for India's targetted adversary.

Indian missile developments are therefore reaching new heights of technical maturity. However, the only missiles actually inducted, the Prithvi, Agni-I and Agni-II, highlight that the full integration of the later Agni platforms into India's nuclear force is still a future aspiration, more than a technical reality. Even so, the announcement of these platforms, as well as the Prahaar, highlights the intentions of the Indian government to field a diversified missile force. Political limits to the eventual size, range, or destructive yield of this nuclear force are difficult to identify. This is despite the fact that projects such as MIRV warheads begin to question the accuracy of 'credible minimum deterrence' as a descriptive term for the direction in which Indian nuclear force is heading, and open questions as to a possible Indian interest in a nuclear warfighting capacity.

AIR-BASED DELIVERY VEHICLES

The IAF serves as the oldest and most technically dependable leg of India's nuclear arsenal. Indeed, this follows a common development chronology:

the American B-52, British V-bomber and French Mirage IV-A acted as the contemporary backstop for their nuclear forces while more advanced land-based missile and sea-based nuclear platforms were being developed. A former chief of the SFC, remarking on the operational status of the nuclear force, affirmed that 'Today it is the air which would be the greater reliance factor as far as India is concerned, the answer to that would be yes.'⁶¹ This looks set to continue in the near term, as the two most likely nuclear-capable aircraft, the Mirage 2000H and Jaguar IS/IB, undergo lifespan extension, while land-based induction proceeds at a slow place.

The Mirage 2000H nuclear-capable bomber, with a range of 1,800 km, is of French origin. Mirages have been historically assigned nuclear missions by the French Air Force.⁶² Two Mirage 2000H squadrons are currently deployed at the Gwalior Air Force Station, 270 km southeast of New Delhi. This location, combined with the range of the aircraft, allows the nuclear-armed Mirage 2000H bombers to strike Pakistan and parts of southwest China.

In 2010, an agreement was concluded with France to upgrade India's entire Mirage fleet of 51 aircraft.⁶³ The refurbishments will extend the lifespan of the fleet by 20–25 years. The refitted Mirage 2000H bombers will also reportedly be able to carry intermediate-range missiles, which could be nuclear-armed. Air-launched missiles currently in development include the short-range (1,000 km) Nirbhay and the Brahmos. If a nuclear-armed version of these missiles is mated to Mirage 2000H bombers, India will be able to significantly extend its air-launched nuclear strike capacity into Chinese territory.⁶⁴

Jaguar IS/IB nuclear-capable aircraft, with a range of 1,600 km, were originally jointly developed by France and Britain. Two Jaguar squadrons, deployed 525 km from Islamabad at Ambala Air Force Station, could be certified for nuclear missions.⁶⁵

India received its first Jaguar aircraft on loan from Britain in 1979. India currently possesses 95 Jaguar IS/IB planes, and is upgrading its entire fleet of Jaguar aircraft. This will extend their lifespan past 2030. As part of the upgrades, the Rolls-Royce Adour-811 turbofan engines are being replaced with more powerful Honeywell F124IN engines.⁶⁶

Although the above two aircraft are the most likely to have nuclear roles, other elements of the IAF are also nuclear-capable. The MiG-27, an 800 km-range nuclear-capable bomber initially fielded by the Soviet Union in the 1970s, could potentially have nuclear roles. However,

persistent safety issues, to the extent that the plane has been labelled a 'flying coffin' by a retired Wing Commander, have led to the decision to phase out their use. This will still only occur at the end of their natural lifespan, around 2030.⁶⁷

The Sukhoi Su-30 MKI, a multirole fighter jet, is being inducted close to the China border, and certain Sukhois are being assigned nuclear missions. India is aiming for a total Sukhoi fleet of 272 aircraft.⁶⁸ The Sukhoi features a maximum range of 3,000 km without refuelling, and 8,000 km with two refuellings.⁶⁹ India is also developing a variant of the potentially nuclear-capable Nirbhay missile to be fitted to certain Su-30 MKI aircraft.⁷⁰ The SFC has ordered that 40 aircraft be assigned for nuclear missions, and 40 Sukhois are being modified to carry Brahmos missiles.⁷¹ Sukhois are being stationed at the Tezpur and Chabua airbases in Assam state, close to the eastern LAC region, and at Bareilly in Uttar Pradesh, near the central region.⁷²

India also committed to purchase 36 French Rafale fighters in April 2015.⁷³ The Rafale is assigned to carry the ASMP-A nuclear cruise missile in the French Air Force.⁷⁴ As India continues to bolster its Air Force and general military presence along its borders with Pakistan and China, this leg of the triad will continue to play a crucial role in Indian nuclear deterrence.⁷⁵

SEA-BASED DELIVERY VEHICLES

India's Draft Nuclear Doctrine (DND), released in 1999 by the National Security Advisory Board (NSAB), stated the requirement of a nuclear triad for the effective projection of India's nuclear deterrent.⁷⁶ If land-based missiles and aircraft delivery systems constitute the first two legs of the nuclear triad, an underwater nuclear launch capability mounted on nuclear submarines forms the third. As a retired admiral highlights, the sea-based nuclear launch capability is important as it can provide for a 'post-surprise attack-survivable force', and hence, would have a 'deep stabilising effect' on nuclear deterrence in the region.⁷⁷ Similar sentiments are shared by India's defence planners as well as the Indian Navy. In the 2004 Indian Maritime Doctrine, the Indian Navy presented the possession of a submarine-based nuclear delivery capability as 'an unstated axiom' of 'an independent foreign policy'.⁷⁸ The 2007 Indian Maritime Strategy similarly states that

'it is vital for a nation to possess nuclear submarines capable of launching missiles with nuclear warheads' for effective deterrence to be achieved.⁷⁹ The most recent iteration of the maritime strategy, issued in 2015, does not notably depart from this emphasis on the importance of sea-based nuclear deterrence.⁸⁰

In the Indian case, there are three main reasons behind this thrust upon developing a force of SSBNs, with the concomitant armament of long-range ballistic missiles tipped with nuclear warheads.⁸¹ First, the removal of India's nuclear forces from the mainland would effectively neutralise the enemy's nuclear targetting. More nuclear weapons at sea would automatically mean less vulnerability. Second, a naval nuclear force based on nuclear submarines is very difficult to detect and destroy, which provides for unhurried retribution after careful evaluation, though ensuring that the effect on the enemy would be catastrophic. These characteristics of a sea-based nuclear force complement India's nuclear doctrine, which calls for massive and assured retaliation. The invulnerability of an SSBN fleet from an enemy first strike, and its virtues of being a very reliable second-strike platform also figured prominently in the 2009 Maritime Doctrine of the Indian Navy.⁸²

Lastly, a robust naval nuclear force would render the need for a large nuclear arsenal redundant. Since nuclear submarines are hard to detect, India need not fear attrition in its nuclear deterrent capability as a result of first strike by the enemy. A minimal nuclear arsenal would suffice to project deterrence. In fact, some experts have argued that once India achieves the capability to fire a nuclear-tipped ballistic missile from the depths of the ocean, the 'country's deterrence could shift entirely underwater and realign its strategy to those of Britain and France'.⁸³

In the last decade, India has made some notable gains in developing the sea-based component of its nuclear deterrence force. India's drive towards a nuclear submarine force dates back to the early 1980s, when it initiated a project to develop fast-moving, deep-diving, nuclear-powered attack submarines, which could be used for hunting surface naval ships.⁸⁴ However, it is important to note that the formal declaration of India's intent to develop SSBNs only came at the end of 2008. According to one analyst, India avoided any formal announcements on its intent to build a naval nuclear force, except in the nuclear doctrine, which put forward the need for such a capability in extremely vague language, before the consummation of the Indo-US nuclear deal in 2008.⁸⁵ This was a

deliberate attempt to avoid any complication in India's accommodation in the global nuclear regime, through which the Indo-US nuclear deal was intended to be achieved.

The Advanced Technology Vessel (ATV) is India's flagship project aimed at developing the third leg of the nuclear triad, as outlined in the DND issued in 1999. Under this project, a number of S-class submarines will be developed in the next 10–20 years.⁸⁶ The first vessel in this class, the S-2, popularly known as 'Arihant' ('destroyer of enemies'), was launched by Prime Minister Manmohan Singh on 26 July 2009.⁸⁷ Arihant is 10 metres in diameter, 106 metres in length, and has a displacement of 5,000–6,000 tonnes.⁸⁸ The costs for INS Arihant have been estimated at \$2.9 billion.⁸⁹

The Arihant is powered by an 80–85 Mega Watt (MW) pressurised water reactor, running on HEU.⁹⁰ The reactor fuel for the vessel comes from DAE's uranium enrichment facilities at the Rare Materials Plant in Rattehalli.⁹¹ This plant had started producing HEU from 1991. The International Panel on Fissile Materials estimates that India's inventory of HEU stands at around 1 ton of 90 per cent enriched U-235.⁹² According to M. V. Ramana, the Rattehalli plant has a current capacity of 4,500 SWU/y, capable of producing 22 kg of 90 per cent enriched uranium.⁹³ Though sufficient for the first vessel, this capacity may be inadequate for the fleet of four to six SSBNs that the Indian Navy envisages in the near future.⁹⁴ However, India has made both qualitative and quantitative changes to its HEU-producing capacity.

Russia has been particularly helpful in India's quest for an undersea nuclear deterrent capability. The reactor design of Arihant was facilitated by Russian expertise and technical assistance.⁹⁵ India has also leased nuclear submarines from Russia in order to learn the trade of operating this complex technological system and train the Indian Navy personnel in nuclear submarine operations.⁹⁶ In 1988, the Soviet Union had provided India with a Project 670 Skat (NATO Charlie-I class) attack nuclear submarine, which remained with the Indian Navy till the end of 1990.⁹⁷ Currently, India operates a Project 971 Shchuka-B (NATO name Akula-II class) SSBN, renamed INS Chakra, leased from Russia for a period of 10 years. INS Chakra joined the Indian Navy in April 2012.⁹⁸ India and Russia are now negotiating a lease of a second nuclear submarine.⁹⁹ India is indeed the only country to have operated a foreign nuclear-powered attack submarine (SSN).¹⁰⁰

The reactor for India's nuclear submarine programme was developed by a joint team of the Indian Navy and the Department of Atomic Energy at the Indira Gandhi Centre for Atomic Research at Kalpakkam, under the pseudonym Plutonium Recycle Project (PRP).¹⁰¹ The conception of the marine propulsion reactor began in the late 1980s, but gathered momentum only in the 1990s. The land-based reactor became operational in November 2003, after which efforts were made to integrate it with the hull of the first S-class nuclear submarine.¹⁰² Launched in 2009, the Arihant initiated sea trials in 2014. Work on the second and the third vessels of this kind—the S-3 and S-4—is already underway.¹⁰³

The Arihant has four Submarine-Launched Ballistic Missile (SLBM) tubes. These can host up to 12 short-range ballistic missiles capable of hitting targets at a range of 500–1,000 km, or four intermediate-range ballistic missiles with a range of 3,500–4,000 km.¹⁰⁴

Table 1.3: Design Specifics of the INS Arihant

Displacement, metric tonnes	5,000–6,000
Length, (m)	106
Hull Diameter	10
Reactor type and power (MW)	Pressurised Water Reactor, 80–85 MW
Reactor Fuel	HEU
Fuel Replenishment Period	10 years
Turbines	47,000 hp, 70 MW
Diving Depth, ft (m)	300 m
Endurance	100 days
Weapons	12 K-15 Sagarika SRBMs, 4 K-4 IRBMs

Source: Frank O'Donnell and Yogesh Joshi, 'Lost at Sea: The Arihant in India's Quest for a Grand Strategy', *Comparative Strategy*, vol. 33, no. 5 (2014).

DRDO is assigned the responsibility for developing the delivery vehicles. The Short Range Ballistic Missile, codenamed K-15 and recently rechristened BO-5, has an effective range of 750 km.¹⁰⁵ This class of ballistic missiles is also called the Sagarika (Oceanic). Within a length of 10.4 metres, it can carry a 5 ton warhead up to a distance of 750 km.¹⁰⁶ It is a two-stage ballistic missile with the underwater boost mechanism being propelled by liquid fuel and the atmospheric phase with a solid-fuel

based propeller.¹⁰⁷ After the November 2012 tests of the missile, DRDO claimed that it was almost ready for integration with the INS Arihant.¹⁰⁸ Around 15 tests from submerged pontoons were conducted between 1998 and November 2015.¹⁰⁹ The K-4/K-X IRBM, with a range of 3,500 km, is also under development.¹¹⁰ A further-reaching SLBM, the 5,000 km-range K-5, is also reportedly being studied by DRDO. The K-4 borrows heavily from the technological lessons learned under the Agni project, and is based on the design of Agni III.¹¹¹

In April 2016, for the first time, DRDO conducted an SLBM launch from onboard the Arihant, signalling the integration of missile components with India's first SSBN.¹¹² However, even if the K-4 is small enough to be hosted aboard the Arihant without substantial modifications, this is unlikely for the K-5. The K-5 missile may therefore have to wait for the larger SSBN redesign that will only arrive with the S-5, the fourth boat in the Arihant class.¹¹³

The DRDO is simultaneously planning to develop MIRV technology.¹¹⁴ Once achieved and successfully integrated with the existing missile systems, it will immensely increase India's capability to deliver nuclear payloads in the second-strike mode. If this technology fructifies, it will substantially enhance India's ability to deliver nuclear payloads from sea or land, beyond the 12 nuclear warheads presently envisaged on each nuclear submarine.

However, a number of technical problems need to be overcome before an active and capable triad can be achieved. Delays have often beset India's major technological projects, including the ATV. Since 2008, projections have been continuously made about the INS Arihant becoming fully operational, but to no avail. Given the series of delayed deadlines, it is not hard to foresee that a fully operational 4–6 submarine force would take at least a decade to be fielded.¹¹⁵

The first major technological hurdle is the successful integration of ballistic missiles with the nuclear submarine.¹¹⁶ Second is the operational success of the miniaturised nuclear reactor under the duress of extensive sea operations.¹¹⁷ Third, the first few submarines, including the INS Arihant, are unlikely to be a major component of India's nuclear deterrent force. In fact, various authorities concerned with the project have characterised the commissioning of the INS Arihant as a technology demonstrator rather than a robust deterrent projector.¹¹⁸ In fact, some also doubt the performance of these vessels, given that the INS Arihant and other similar vessels of the S-Class belong to the first and second generation of SSBNs. As one analyst

argues, 'It is only when the S-5 vessel with a new design and a powerful nuclear reactor is launched, which could be two decades away, can India hope to have a semblance of sea-based deterrence against China.'¹¹⁹

Fourth, strategic analysts are concerned over the range of ballistic missiles for India's future SSBNs and consider it 'grossly insufficient' for effective deterrence.¹²⁰ The limited range of K-15 or Sagarika, many argue, is a cause for concern, as the submarines would have to move closer to enemy shores in order to fire these missiles for the effective destruction of the opponent.¹²¹ This would, in turn, make them extremely vulnerable to detection and ultimately destruction though anti-submarine warfare. Many are also concerned with the nuclear delivery capacity of the K-15 missiles for the Arihant.¹²² These concerns are mainly regarding the size of the nuclear warhead that will be delivered by these ballistic and cruise missiles, and whether India has sufficiently miniaturised warhead designs in order to successfully integrate it with these rather small missile platforms.

However, once these technical issues have been addressed, there remain other questions about the eventual role of the Arihant in India's defence posture. Indian strategic discourse has suggested several potential missions for it, ranging from offering greater technical assurance to India's nuclear deterrence, to demonstrating symbolic resolve against Chinese incursions in the Indian Ocean.¹²³ Greater political guidance is needed from the government as to the specific mission of the Arihant-class fleet in Indian defence, and for the explicit recognition of its inherent limits as a last-resort nuclear backstop. This reflects the recurring issue in Indian nuclear force development: that of the growing lack of public correspondence between the ambitions of technical nuclear force development and the stated posture concept of 'credible minimum deterrence'.

COMMAND AND CONTROL¹²⁴

India has set up a robust command-and-control structure to manage decision-making regarding its nuclear force. However, this structure, designed to channel the decisions of the top political officials, will only operate as well as the attentions of these officials permit. This is revealed by the growing disjuncture between nuclear force development and doctrinal statements, despite the existence of this structure.

Following the 1998 nuclear tests, the Indian government established new institutions to manage nuclear policymaking. This replaced a previous informal command chain that concentrated authority in the Prime Minister's Office. In the wake of the tests, a more transparent command structure was considered necessary to reassure the world of, in the words of a former NSAB chair, the principle that '... the very nature of nuclear deterrence as practiced by a civilian democracy dictates that decisions relating to the nature and scope of the arsenal, its deployment and use, be anchored in the larger architecture of democratic governance.'¹²⁵

The two new institutions established are the Nuclear Command Authority (NCA) and SFC, publicly announced in the 2003 iteration of India's nuclear doctrine.¹²⁶ The NCA exists for civilian officials to consider and issue nuclear deployment orders.¹²⁷ The SFC, led by military service chiefs, receives and executes orders from the NCA while also managing the operationalisation of the nuclear force.¹²⁸

The membership of the NCA consists of two tiers: a political council chaired by the Prime Minister, and an executive council chaired by the National Security Adviser. The political council includes the Cabinet Committee on Security (constituting the Prime Minister, Defence Minister, Home Minister, Finance Minister and External Affairs Minister) and the National Security Adviser. The executive council is established to advise the political council and organise the execution of its orders. The executive council is chaired by the NSA, and likely includes the Cabinet Secretary, Principal Scientific Advisor, Foreign Secretary, and the chiefs of DAE, DRDO, Research and Analysis Wing, Intelligence Bureau, Joint Intelligence Committee (JIC) and SFC.¹²⁹ A Strategic Planning Staff (SPS) also exists within the NCA and provides 'strategic inputs on the quality and reliability of India's nuclear weapons and delivery systems, foreign intelligence, global arms control and disarmament initiatives, and long term planning for the arsenal'.¹³⁰

The second institution is the SFC. This is headed by a rotating military chair and the three service chiefs, and exists to organise the military execution of orders emanating from the NCA. In the event of a decision to use nuclear weapons, the command structure is organised so that the decision is made solely by the NCA political council; its execution organised by the NCA executive council; and ultimate execution conducted by the SFC.¹³¹

The NCA meets intermittently to review aspects of nuclear force development, with one report specifying that these meetings are held 'every three to six months'.¹³² The functioning of the NCA and SFC remain works in progress. There are notable efforts to build security into agency operations, including the existence of hardened facilities for NCA council meetings and an alternate NCA command chain, in the event of hostilities disrupting the first chain laid out above. NCA processes are also reportedly aided by two National Security Council (NSC) Secretariat (located within the Prime Minister's Office) groups, consisting of a Strategy Programme Staff and a Strategic Armament Safety Authority. The former group, including both military and civilian officials, examines potential future Indian nuclear force postures, while the latter assesses the quality of nuclear armaments storage.¹³³

The existence of civil-military coordination mechanisms within the NCA structure, as well as the two dedicated planning groups detailed above, have been cited as evidence that the Indian government has achieved more effective political and technical oversight over nuclear force development as compared to the previous political eras. The structural participation of the military in these multiple elements of the nuclear command chain, in this reading, suggests its greater involvement in nuclear force development.¹³⁴

However, there are still limits to this trend. At present, the office of the Chairman of the Joint Chiefs of Staff Committee (CJCSC) coordinates the execution of joint SFC-armed forces procedures to mate warheads to delivery vehicles in the event of an order to do so from the NCA. This Chairman position is currently held by the most senior of the three existing armed forces chiefs, leading to a higher turnover rate, with the chairmen occasionally serving less than a year in post. The Chairman also currently retains operational responsibility for his own service during this tenure.

The Prime Minister was reportedly briefed in late May 2014 on the need to appoint a four-star CJCSC for a two-year term to assume operational management of the nuclear arsenal, with service responsibility to be assigned to a different service chief. SFC officials and external analysts feel such a reform will enhance the focus and coordinative ability of the Chairman in implementing NCA directives. Nevertheless, this recommendation was in a 'planning' stage as of 2017.¹³⁵

The existence of these new structures, however, has also left one of the core issues within Indian nuclear force development—the discrepancy

between the respective levels of confidence of the DRDO and the military in the technical reliability of nuclear missiles—unaddressed. DRDO conducts very few tests of its missiles before announcing them ready for military induction; its Director General remarked in July 2015 that ‘To declare a missile proven, we need three consecutive successful tests.’¹³⁶ By comparison, the US Minuteman-I ICBM had been tested 56 times by 2002, and the Trident-II D5 SLBM, carried aboard American and British SSBNs, had been successfully tested 155 times by February 2015.¹³⁷

The military has historically not shared the confidence of DRDO in this technical reliability certification system.¹³⁸ Commenting on the Agni-I and Agni-II missiles in 2008, a retired Army officer observed that they had ‘been tested five times, which is inadequate to generate confidence in a nuclear capable missile’.¹³⁹ A retired naval officer and nuclear expert notes that ‘there is no adequate user acceptance system in place for inducting missiles into the strategic arsenal’.¹⁴⁰

Concerns regarding warhead performance join the above issues with general missile reliability. A committee was reportedly established by the Prime Minister in order to investigate claims made by retired DRDO scientist K. Santhanam in 2009 regarding underperformance of the thermonuclear device tested in 1998.¹⁴¹ While the new civil–military structures and planning cells detailed above may aid some elements of nuclear force planning, their existence has evidently not led to a resolution of the differences between the defence scientific agencies and the military regarding missile reliability standards, one of the most central issues in contemporary Indian nuclear force development. Moreover, the need, as perceived by the Prime Minister, to set up a new committee in order to investigate warhead performance, raises additional questions regarding the ability of these existing entities to assure reliability. It therefore appears premature to suggest that these new oversight structures are successfully addressing the political and technical governance questions regarding Indian nuclear force development raised throughout this chapter.

BALLISTIC MISSILE DEFENCE (BMD)

India is currently involved in the research, procurement and development of indigenous and external BMD systems.¹⁴² However, it is unclear if these programmes have been shaped by a government assessment of the

full interactions of different BMD postures with India's conventional and nuclear force policies. A number of factors in recent times have made India interested in these systems: China and Pakistan's growing nuclear arsenals; chances of accidental launch from Pakistan; fears of a bolt-from-the-blue-strike on India; Pakistan's unstable political situation and the growing influence of non-state actors, especially in Pakistani body-politik.¹⁴³ However, the seeming operational discretion of DRDO to build and test its indigenous BMD systems also creates reliability concerns regarding the accuracy of its capability claims. India's BMD programmes, similar to those of nuclear force development, need to be directed by a strategic defence review and regularly evaluated in order to ensure that they meet national defence goals.

India's interest in BMD systems goes back to the initiation of the IGMDP of 1983.¹⁴⁴ IGMDP not only led to the development of offensive missile platforms like the Prithvi and Agni series, but also had a defensive component in the form of Akash Surface-to-Air Missiles (SAM), which were initially planned for air defence measures and were equipped with the potential for conversion to a theatre missile defence system.¹⁴⁵ In the 1990s, DRDO started conceptualising a missile defence plan for India. Subsequently, DRDO and the Indian military also entered into negotiations for BMD platforms and associated technologies with Israel and Russia.¹⁴⁶

Currently, the Indian BMD system boasts of both exo-atmospheric as well as endo-atmospheric ballistic missile defence capability, providing India with a two-layered system.¹⁴⁷ Whereas Prithvi air-defence (PAD) is supposed to tackle incoming missiles at a range of 50–80 kms (exo-atmospheric interception), the advanced air-defence (AAD) mainly consists of SAM, and it can kill incoming missiles at the range of 15–30 kms (endo-atmospheric interception). Clearly, if the PAD system is devised for mid-course interception, the AAD is a terminal phase interception system which can only counter incoming missiles after their entry into the atmosphere. In their present configuration, these systems are designed to counter missiles with range close to 2,000 km and of speeds ranging from Mach 3 to Mach 8. However, DRDO has recently announced its intentions to intercept missiles with over 5,000 km range.¹⁴⁸ These systems, named AD-1 and AD-2, could be able to counter missiles with a velocity of up to Mach 12–15.¹⁴⁹

To augment its capability to track incoming enemy missiles, India has imported two phased-array Green Pine Radars from Israel in 2002 and

2005, which the later uses in its Arrow missile defence system.¹⁵⁰ India had quietly initiated technical collaboration with Israel for developing a long-range tracking radar (LRTR) and with France for guidance control radar prior to the 1998 nuclear weapon tests.¹⁵¹ The Swordfish LRTR, based upon the Green Pine radar technology, can reportedly track more than 200 objects with a minimum 2-inch diameter at a range of 600–800 km.¹⁵² DRDO plans to further extend the range of this radar system to 1,500 kms. India had previously acquired the Phalcon Airborne Warning and Control System (AWACS) from Israel at a cost of \$2 billion, providing India with a capability of low-level detection of hostile missile platforms, and considerably enhancing the response time for missile interception.¹⁵³

Although these are indigenous efforts to develop both mid-course and terminal-phase interception capabilities, India has looked abroad for more limited or pinpoint defences. India employs the Barak anti-missile defence system on its naval ships, and has purchased S-300 anti-missile systems from Russia.¹⁵⁴ The US Bush administration has also expressed interest in selling Patriot (Phased Array Tracking Intercept of Target) Advanced Capability (PAC-2) anti-ballistic missile systems to India, following the conclusion of the Next Steps in the Strategic Partnership (NSSP) process in December 2004.¹⁵⁵ However, India has recently expressed more interest in the further advanced PAC-3 system.¹⁵⁶

India is also studying the Israeli Arrow missile defence system. However, as this is co-developed with US expertise, sale of this system to India would require US permission.¹⁵⁷ Still, the US has generally shown increasing openness to the prospect of joint missile defence system development with India in recent years.¹⁵⁸

It is important to point out that these above systems are ineffective for the interception of long-range ballistic missiles. Rather, their usefulness lies in intercepting tactical ballistic missiles of short range and medium velocities, and in augmenting India's endo-thermic missile interceptions, thereby increasing the redundancy in missile interception.¹⁵⁹ Therefore, these may be used only in point defences. Despite these limits, regular engagement with the US, Israel and Russia regarding system development allows India to observe a general evaluation of missile defence technology in these countries.

Since 2006, India has been actively testing components of its indigenous BMD programme. Over 10 missile interception tests have been conducted by DRDO, with the latest in May 2016.¹⁶⁰ DRDO has claimed

that more recent tests have been executed in a deployment mode, with members of the Indian Army and Air Force observing the test.¹⁶¹ During a recent test series, DRDO demonstrated its capability to simultaneously intercept multiple targets using both the AAD and PAD systems.¹⁶² Soon after these tests, V. K. Saraswat, the then Director General of DRDO, declared that India would be ready to field area BMD systems by early 2014, that were able to protect New Delhi and Mumbai.¹⁶³ However, it is uncertain at this time when such systems will be truly operable.

Table 1.4: Ballistic Missile Interception Tests by DRDO¹⁶⁴

System	Date	Results
PAD	November 2006	Successful interception at 50 km
AAD	6 December 2007	Successful interception at 15 km
PAD	6 March 2009	Successful interception at 75 km
AAD	15 March 2010	Tests aborted (Hostile missile lost trajectory)
AAD	26 July 2010	Successful interception at 15 km
AAD	6 March 2011	Successful interception at 16 km
AAD	10 February 2012	Successful interception at 15 km
PAD/AAD	23 November 2012	Multiple interceptions accomplished by destroying incoming projectiles at altitudes 15 and 120 kms. Whereas AAD was a physical interception, the PAD test was an electronic simulation.
PDV	27 April 2014	Unsuccessful 'near miss' of target
AAD	6 April 2015	Unsuccessful miss of target
AAD	22 November 2015	Unclear whether interception occurred
AAD	15 May 2016	Successful interception at 20–40 km
PDV	12 February 2017	Successful interception at 100 km
AAD	1 March 2017	Successful interception at 65 km

Indeed, similar claims have been made before, and there appears to be a tendency towards premature declarations of capability of India's missile interception programmes among the defence scientific enclave.¹⁶⁵

There is also some dispute regarding the claimed accuracy of these interceptions. Though DRDO has claimed a 90 per cent accuracy level, external analysts are not very convinced. This is especially compared to the interception accuracy of around 70 per cent for other advanced-technology states.¹⁶⁶

Also, given that the tests have been conducted in controlled environments, critics have further questioned DRDO claims that these systems are ready for deployment.¹⁶⁷ The missiles targetted in these interceptions are slow-moving Prithvi missiles. Sceptics have also argued that the resultant DRDO claim of an effective BMD system seem exaggerated, if analysed against missiles which travel at far greater speeds based on solid-fuel booster mechanisms.

The confidence of the Indian government in the above technical claims regarding indigenous capabilities and the timeframe for their induction may be partly read through its recent decisions to buy new Russian missile interception systems. The MoD approved the purchase of up to five Russian S-400 Triumph air and missile defence systems in December 2015, at an estimated cost of between \$4.5 to 7 billion.¹⁶⁸ The IAF reportedly urged this purchase in light of doubts regarding the progress in developing indigenous BMD capabilities.¹⁶⁹

An agreement for India to buy five systems from Russia for \$6 billion was reported in October 2016.¹⁷⁰ Three systems would likely be positioned in the west in support of Indian defences against Pakistan, and two systems would be allocated in the east against China.¹⁷¹ An analyst notes that 'The S-400 outperforms India's AAD on nearly all counts, including flight speed when fitted with the upgraded 48N6 interceptor.'¹⁷²

A cooperation agreement has also been signed between Reliance Defence, an Indian defence contractor, and Almaz-Antey JSC, a Russian defence firm that holds the S-400 technology license, in December 2015. Reliance Defence has specifically identified the S-400 system as a target for cooperation. It has also identified the Tor 1-M surface-to-air missile system, which can intercept some terminal-phase cruise missiles, as a second potential focus of cooperation.¹⁷³ The readiness of the Indian government to commit such substantial financial resources to this off-the-shelf purchase of foreign BMD systems, at the reported behest of the IAF, suggests limits to its confidence in the reliability and deliverability of the indigenous systems as promised by DRDO.

THE FUTURE OF INDIAN BMD

As far as the scope of missile interception is concerned, there are indications that India will opt for limited coverage rather than the development of a national missile interception capability.¹⁷⁴ Three reasons underpin this development trajectory. First, for Indian strategists, a limited missile interception would better complement India's nuclear doctrine.¹⁷⁵ Second, and perhaps more determinatively, the development of a pan-national missile interception capability is simply beyond India's economic means. With increasing capabilities in the booster strength of its ballistic interceptors and of its ground radars, it is hard to foresee a mission creep in India's ballistic missile interception programme. This is at variance to the emerging tendencies of technical mission creep visible in India's nuclear force development. Last, some have argued that limited defences may help in augmenting strategic stability in South Asia.¹⁷⁶

Nevertheless, this principally economic reasoning as the best guide to understand the contours of India's future BMD programme reflects again its evolution by a defence scientific enclave, with little directive alignment with the clear national defence objectives that would be set by a strategic defence review. This is an important point, as India's BMD capabilities, while still nascent and arguably mostly unproven, can still affect regional deterrence relationships, and thus impact Indian nuclear policy. A Pakistani analyst has written of the deterrence challenge of a hypothesised Indian Cold Start conventional attack shielded from retaliation by BMD.¹⁷⁷ The perceived Indian BMD threat has also been remarked upon by the current Pakistan Permanent Representative to the UN in justifying Pakistan's nuclear arsenal growth.¹⁷⁸ The Chinese neuralgia with BMD systems as a threat to its minimum deterrent posture has also been well-documented.¹⁷⁹ For a BMD capability to most effectively serve Indian defence, it must be assessed as part of a wider strategic defence review, which would identify India's exact BMD requirements as part of defining its national security objectives.

CONCLUSION

India's nuclear force in 2017 is therefore scaling new heights of technical achievement at an unprecedented rate. Progress in delivery vehicles are

seemingly constrained only by the present limits in technical knowledge. India today stands on the brink of possessing ICBMs, a potential new generation of short-range nuclear-capable missiles, and a seaborne nuclear-armed submarine fleet. While there are some measures of restraint in place, such as the testing moratorium practised since 1998, the wide scope and ambition of nuclear force development is increasingly difficult to reconcile with India's stated nuclear posture of 'credible minimum deterrence'.

While impressive progress is being made in delivery vehicle development, the Indian nuclear force is affected by governance issues. DRDO and DAE evidently enjoy broad discretion in conceiving, planning and fielding new nuclear capabilities. Their technical ambitions, now entering the realms of thermonuclear and multiple-warhead ICBMs and short-range nuclear weapons, threaten to undermine India's stated nuclear doctrine of restraint. Also, as it is in their bureaucratic interest to announce eye-catching new nuclear projects, the rapid successive unveiling of the latter Agni models has not been matched with an equal effort to ensure their full operational credibility. Only the Prithvi, Agni-I and Agni-II have graduated from the developmental stage to military deployment. A third wrinkle is the technical doubts surrounding the viability of Indian thermonuclear warheads following the 1998 'fizzle', which are perpetuated by the opaque nature of India's strategic enclave and its resistance to any kind of external peer review of its claims.

Other governance issues also surface in the study of India's nuclear command chain. While it establishes clear principles of elected civilian decision-making supremacy and transparency in the flow of orders, ad hoc practices characterise the irregular meeting times of the apex of NCA and the staff of SFC, the latter determined by inter-service haggling. India's unique civil-military relations, featuring an overweighting of the civil over the military, also influences the command chain, with military expertise relegated to the second tier of the NCA, and with little institutional voice in other elements of Indian nuclear decision-making. As with the technical hardware of Indian nuclear force development, these 'software' concerns, revolving around effective governance, also demonstrate that the full operationalisation of India's stated capabilities remains a work in progress.

Nevertheless, the growing diversity of India's delivery vehicles generates questions as to the continued correspondence of its nuclear posture with the concept of 'credible minimum deterrence', or whether a transition toward fielding warfighting capabilities is taking place. Developments

at the lower end of the range spectrum, such as the potentially nuclear-capable Prahaar, Brahmos and Nirbhay, threaten to blur the line between conventional and nuclear conflict. At the upper end of the spectrum, no range limit appears to have been set for the Agni series. A strategic defence review, including a reassessment of Indian nuclear policy, is required to clarify the Indian nuclear doctrine and posture in light of its changing delivery vehicle portfolio, and ensure that India's nuclear force remains categorised as a last-resort tool.

India's expanding strategic footprint is, however, not entirely driven by an abstract technological quest; it is equally influenced by the myriad security challenges it faces in the nuclear domain, especially by its nuclear adversaries: Pakistan and China. The next chapter will look in detail at the nature of the security challenges posed by Pakistan, and how these amplify the above questions regarding how India will situate its nuclear force in its regional context.

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Pakistan's Nuclear Thought and Posture *Implications for India*

India faces two principal strategic adversaries, Pakistan and China, which present combined security challenges to India that are experienced by few other states. While idiosyncratic in their traditions of nuclear thought and the type of challenges they pose to India, China and Pakistan have also colluded in bilateral projects to enhance nuclear deterrent platforms and supportive infrastructure. The ultimate strategic intentions of Pakistan and India, from the point of view of each other, are clouded in threatening ambiguity. New Delhi is also concerned about the growing Chinese Indian Ocean projection and an apparent new wave of nuclear technology support to Pakistan. The scale of mistrust in the India–Pakistan and India–China bilateral relationships is often difficult to fully capture; in fact, a book has recently been devoted to documenting the neuralgic fears of China that often circulate in the Indian strategic community.¹

Inequitable power differentials further complicate this triad. Pakistan's history of several wars fought against India, including suffering permanent territorial amputation in the 1971 War, has led its policymakers and analysts to view India as the principal external threat to its survival as a state. To asymmetrically compensate for the disparities in the comparative sizes of population, economy and perceived conventional power projection capabilities between India and Pakistan, Pakistan has been increasingly emphasising the role of its nuclear force in its general defence. Unlike India, Pakistan refuses to adopt a no-first-use posture; Islamabad envisions a lower threshold of nuclear use than India does. Pakistan's nuclear force, in terms of warhead numbers and production rate, is believed by many analysts today to exceed that of India.

To underline this emphasis on its nuclear force against India, Pakistan has recently introduced a 60 km-range nuclear missile, the Nasr, which is widely viewed as intended for nuclear first-use against an Indian

cross-border conventional advance. No peaceful long-term resolution to the India-Pakistan standoff, based upon an end to Pakistan-sponsored terrorism and a mutually satisfactory solution to the Kashmir issue, appears in sight. As the disparity between the economic and conventional military capacities of the two states continues to grow, while their nuclear forces continue to diversify, the task of ensuring stable bilateral relations will grow ever more challenging. Indeed, the coming years will witness the likely entry of this rivalry into a new dimension: naval nuclear-armed deterrence.

The following two chapters will explore in more detail the nuclear thought and posture of Pakistan and China; how these interact with India; and the security challenges the three states will face in the coming years. This chapter will examine Pakistan, while Chapter 3 will focus on China. These two chapters will argue that while this nuclear triad is already complex, managing stable relations will be further complicated by two developments: the blurring of conventional and nuclear capabilities and thresholds by Pakistan and China, and the advent of nuclear-armed naval fleets fielded by all three states. A lack of doctrinal clarity in this context will prove ever more costly for each state in the triad, as the state may find itself plunged into a scenario which it is unprepared for; in which it must decide its nuclear stance in the heat of a crisis, rather than through clear prior planning and communication in peacetime.

This underlines the need for greater doctrinal clarity, as well as a trilateral nuclear dialogue among India, China and Pakistan to clarify strategic intentions and mutual conceptions regarding the use of nuclear force. While there are bilateral strategic dialogues between India and China, India and Pakistan, and Pakistan and China, there is still no institutionalised trilateral nuclear dialogue. As their strategic competition increases, this process could help to reduce the demand for nuclear weapons in all three states, as well as reducing the risk of miscommunication or misperception during a crisis that could lead to its further escalation.

PAKISTAN: OVERVIEW

Pakistan's nuclear force has been developed to address longstanding insecurities within the country regarding the conventional superiority of India. The experience of India engineering the permanent loss of East Pakistan (now Bangladesh) in its 1971 War with Pakistan was a

direct trigger for the Pakistan nuclear weapons programme.² Ensuring the territorial integrity of Pakistan against another Indian conventional invasion became the *raison d'être* of the programme. This linkage of the programme to continuing pervasive fears of Indian subjugation among Pakistan's security community, plus the bureaucratic interest of its powerful defence establishment in expanding its aegis, suggest that there is little constituency in favour of restraint in nuclear force production in Pakistan. Indeed, Pakistan today has the one of the fastest-growing nuclear arsenals in the world, and one which is India-specific in its conception and targetting.

This chapter will first explore Pakistan's tradition of nuclear thought, organised around nuclear weapons as an asymmetric defence to India's perceived conventional superiority. This view of the unique utility of nuclear weapons for Pakistan, which leads to expansive nuclear arsenal development and a first-use doctrine to deter potential Indian conventional attacks, has characterised its nuclear force development from 1998 to present. It will next outline Pakistan's current nuclear force posture, and how this may change in the light of emerging platforms. The chapter will conclude by exploring the consequences of these shifts for Indian security.

PAKISTAN THREAT PERCEPTIONS AND EFFECTS ON NUCLEAR DOCTRINE

The humiliating and chilling experience of India's forcible amputation of East Pakistan as a part of its national entity in the 1971 War, with the subsequent worry that India could return to ensure the dissolution of the remainder of Pakistan, drove the early Pakistan nuclear weapons programme. As the programme progressed in the 1980s and 1990s, several flashpoints fuelled this core insecurity propelling it. India's Operation Brasstacks military exercise in 1986–87, a massive military mobilisation, was perceived by Islamabad as preparation for a major cross-border invasion, with Pakistan's military nuclear facilities as likely targets. This was later confirmed by the Indian architect of the mobilisation, General K. Sundarji, who admitted that the operation 'was the last chance India had to dominate a non-nuclear Pakistan'.³ The 1998 Indian nuclear tests also triggered fears in Pakistan that India, now shielded by its new

nuclear deterrent, would immediately attempt to destroy Pakistan's nuclear capabilities. Pakistan's armed forces were placed on the highest alert, and its nuclear establishment raced to conduct nuclear tests and emphasise its overt nuclear deterrent.⁴

Since the 1998 nuclear tests, Pakistan-sponsored militant groups, operating from Pakistan territory, have conducted increasingly bold strikes within India. These include the Lashkar-e-Taiba (one of the largest militant organisations in Pakistan) attack on the Indian Parliament in December 2001, with the militants at one point coming just 25 yards from the Minister of External Affairs before being put down by Indian security forces.⁵ In November 2008, a group of Lashkar-e-Taiba militants, arriving in Mumbai by boat from Karachi, launched a multi-day killing spree throughout the city. Targets included the Chhatrapati Shivaji Terminus central train station, the Taj Mahal Palace and Tower and Oberoi Trident hotels, and the Nariman House Jewish centre. Through gunfire and the planting of bombs for nearly 60 hours, the terrorists killed 166 people before being stopped by Indian security forces.⁶

These increasingly audacious strikes have led to Indian frustrations. Its policymakers and defence community perceive that Pakistan's nuclear force and India's fear of escalation prohibits India from sufficiently punishing Pakistan and these militant groups in the wake of these attacks.⁷ These frustrations led the Indian Army to develop a 'Cold Start' doctrine in 2004. Premised upon the notion that there is space for limited conventional war with Pakistan before the conflict approaches the nuclear threshold, the doctrine intends the rapid mobilisation of Indian mechanised forces, from a 'standing cold start', to quickly seize and hold shallow tracts of Pakistan territory as leverage to coerce Pakistan into ending support for sub-conventional strikes upon India.⁸ There was also recognition within the military that the Revolution in Military Affairs (RMA) and India's force modernisation plans may provide opportunities to effectuate such a strategy.⁹ Viewed from Pakistan, 'Cold Start' is the newest face of the continuing Indian threat to invade and dismantle its sovereignty. Pakistan official and semi-official statements regularly invoke 'Cold Start' as a core reason for why Pakistan needs a nuclear force and to continue developing new delivery platforms. While the doctrine has never been formally adopted by the Indian armed forces or supported by its political leadership, India regularly conducts military exercises that appear to

feature 'Cold Start'-like operations. An example is the 'Drad Sankalp' exercise that concluded in December 2015. This involved 45,000 soldiers, and emphasised 'swift, high-intensity attacks into enemy territory', including 'hundreds of T-90 and T-72 main battle tanks, artillery guns and multiple-launch rocket systems'.¹⁰

The perceived threat of an Indian conventional attack has further been underlined by a successful Indian operation conducted within Myanmar territory in June 2015, to eradicate militant groups hosted there but operating within India.¹¹ In the wake of the Myanmar raid, an Indian minister stated that 'we will carry out surgical strikes at the place and time of our own choosing', and, in a clear reference to India's western border with Pakistan, 'western disturbances will also be equally dealt with'.¹² In response, a Pakistan minister drew attention to Pakistan's nuclear force as the shield against such plans: 'We are not Myanmar. Don't you know our military strength? Pakistan is a nuclear nation. India should stop day dreaming'.¹³ Such Pakistan concerns could be further amplified by the 'surgical strike' India conducted against militants on the Pakistan side of the Line of Control (LoC), following the Pakistan-sponsored attack on the Uri Indian Army base in September 2016.

Pakistan has not articulated a no-first-use policy, reflecting the origins of its nuclear force as an effort to address India's perceived conventional superiority. It has not issued an official public nuclear doctrine, but the broad outlines of its doctrine have been made clear in semi-official statements by serving and retired defence officials. The most comprehensive explanation has been provided by Lt Gen. Khalid Kidwai, who, from 2000–13 headed the Strategic Plans Division (SPD) that directs Pakistan's nuclear force complex.¹⁴ While now officially retired from that role, his public comments are held by external analysts as indicative of current thinking within Pakistan's nuclear establishment. In an interview with scholars in 2002, he outlined four principal dimensions of vulnerability for Pakistan that could trigger nuclear use:

Nuclear weapons are aimed solely at India. In case that deterrence fails, they will be used if

- a. India attacks Pakistan and conquers a large part of its territory (space threshold)
- b. India destroys a large part either of its land or air forces (military threshold)

- c. India proceeds to the economic strangling of Pakistan (economic strangling)
- d. India pushes Pakistan into political destabilisation or creates a large scale internal subversion in Pakistan (domestic destabilisation).¹⁵

The latter two thresholds—the economic and domestic–political—are an addition to the traditional focus by states on territorial and conventional military integrity, as represented by the first two thresholds in this list.

The economic threshold is often held by analysts to refer primarily to the threat of Indian naval blockade, which could immobilise Pakistan's naval forces and substantially reduce its commercial activity and oil imports.¹⁶ These thresholds, in outlining the multiple perceived avenues by which India could engineer Pakistan's state collapse, reveal the depth of concern within Pakistan's security establishment regarding Indian strategic intentions. The perceived relevance of nuclear weapons as a bulwark against each category of Indian aggressive action helps to explain the mushrooming growth and diversification of Pakistan's nuclear arsenal.

Having surveyed the threat perceptions that underpin Pakistan's nuclear thought, we will now explore its nuclear posture that flows from these influences.

PAKISTAN'S NUCLEAR POSTURE¹⁷

The concept for Pakistan's nuclear doctrine at the time of the 1998 tests has been described by Kidwai as 'credible minimum deterrence'. This was the same phrase then used by Indian officials to describe their nuclear force; implying that the state will seek the smallest nuclear force able to deter that of its adversaries, but that this force can still change as that of its adversaries do, in order to ensure continued deterrence. A 10-year nuclear force development plan was agreed after the 1998 tests, and Kidwai has implied that this included a certain targetted number of warheads or delivery vehicles.¹⁸

In 2005, Pakistan President Pervez Musharraf stated that Pakistan had attained a minimum deterrent capability.¹⁹ However, in April 2006, a meeting of the NCA reviewed the implications of the US–India civil nuclear agreement for India's potential for military fissile material production. A

former American intelligence official claims that this meeting likely took into account analyses by critics of the agreement, which estimated that Indian fissile material production could dramatically increase. This was based on the theory that India's new international access to nuclear fuel for civilian energy could permit the state to devote its entire domestic uranium resources to its military nuclear programme.²⁰

Following the April 2006 NCA meeting, a press release specified that 'in view of the fact that the (India civil nuclear) agreement would enable India to produce significant quantities of fissile material and nuclear weapons from unsafeguarded nuclear reactors, the NCA expressed firm resolve that our credible minimum deterrence requirements will be met.'²¹ This strongly suggests that Pakistan increased its nuclear force production efforts as a result of this review.

The revelation of the 'Cold Start' doctrine has also had an impact on Pakistan's nuclear thought. Speaking in 2015, Kidwai stated that the 'Cold Start' had compelled Pakistan to discard 'credible minimum deterrence' and adopt a new posture, now organised around the concept of 'full spectrum deterrence'. 'Full spectrum deterrence' intends to ensure that Pakistan is willing and able to use nuclear force at every level of conflict; as Kidwai emphasised,

And we hope, therefore, that the complete spectrum that we say, the full spectrum, strategic, operational, tactical, all three levels of nuclear weapons have been covered, and therefore we have now deterred—in our thinking—the tactical level operations under the Cold Start Doctrine as well.²²

'Full spectrum deterrence' conceptually closely aligns with Pakistan's posture of asymmetric escalation, which intends to advance a credible nuclear counterthreat against conventional or nuclear challenges to ensure escalation dominance at each level of conflict. However, current and former Pakistani officials have not entirely discarded 'credible minimum deterrence'; it is still rhetorically referred to in their official statements and analyses.²³ Nevertheless, Pakistan's emerging nuclear posture, best encapsulated by the introduction of the Nasr missile and the fast rate of arsenal production, is better characterised by the doctrine of 'full spectrum deterrence'; indeed, it is difficult to see where 'minimum' would now be an accurate adjective to describe its developments.

PAKISTAN NUCLEAR CAPABILITIES

Pakistan has one of the fastest-growing nuclear forces in the world. It is diversifying its delivery vehicles with intentions to build land-based long- and short-range ballistic missile and sea-based nuclear platforms. It is further investing in its already considerable fissile material infrastructure. Pakistan opened two new heavy water plutonium production reactors, Khushab-III and Khushab-IV, in 2013 and 2015. This complemented the two reactors already present at the Khushab complex in Punjab province.²⁴ A Pakistan official has reportedly stated that the plutonium produced at the Khushab site will be allocated to a new generation of 'smaller, shorter range nuclear weapons, including tactical nuclear-tipped missiles' under development.²⁵

This marks a transition in the fissile basis of Pakistan's nuclear arsenal, which has historically relied on weapons-grade HEU. Pakistan has operated an enrichment plant at Kahuta in Punjab since the early 1980s. There are also reports of a second enrichment facility in service at Gadwal near Islamabad, built in the late 1990s.²⁶ Pakistan's combined plutonium and HEU production rate is estimated to be sufficient to generate between 10 and 27 new warheads annually.²⁷ This is on top of an estimated HEU stockpile of up to 3.29 tons and plutonium stockpile of up to 230 kg.²⁸ Analysts estimate that Pakistan possesses between 110 and 170 warheads, a larger number than that of India (between 90 and 120 warheads).²⁹

Warheads are stored separately from delivery vehicles in peacetime, a practice that reduces the risk of accidental use, and which Pakistani officials highlight as an example of responsible stewardship of nuclear weapons.³⁰ However, maintaining this separation will prove more difficult with some of its new and future delivery vehicles, especially submarine-launched cruise missiles and the Nasr short-range missile. Both delivery vehicles will need to be deployed to the field fully-armed in order to be usable. This could increase the chances of accidental use based upon misperception or miscommunication.

Pakistan's current nuclear delivery platforms give it the ability to hold all Indian territorial targets at risk. However, it is still diversifying these platforms, with notable projects including the Nasr, the Shaheen-3, a 750 km-range ballistic missile, and the Ababeel, a 2,200 km-range ballistic missile designed to host multiple warheads.³¹

As Pakistan intends to field a naval nuclear deterrent force in the coming years, new sea-launched missiles or naval variants of existing missiles will join the list of delivery vehicles below. Indeed, Islamabad recently tested a 450 km-range Babur-III submarine-launched nuclear cruise missile (SLCM).³²

Table 2.1: Pakistan Nuclear Forces, 2018³³

Delivery Vehicle	Range (km)	Status
Aircraft		
F-16 A/B Aircraft	1,600	Inducted
Mirage V Aircraft	2,100	Inducted
Ballistic Missiles		
Nasr (Hatf-9)	60	Inducted
Ghaznavi (Hatf-3)	400	Inducted
Ghauri (Hatf-5)	1,200	Inducted
Abdali (Hatf-2)	180	In Development
Shaheen-1 (Hatf-4)	750	In Development
Shaheen-2 (Hatf-6)	2,000	In Development
Ababeel	2,200	In Development
Shaheen-3	2,750	In Development
Cruise Missiles		
Babur (Hatf-7)	350-750	In Development
Ra'ad (Hatf-8)	350	In Development

In common with the development history of several NWS, Pakistan's early nuclear force relied upon air-delivered gravity bombs. However, it is now transiting towards greater use of land-based ballistic missiles and preparations for a sea-based nuclear deterrent.³⁴ The range of the Shaheen-2 missile gives Pakistan the ability to target the entire Indian territory, and thus might be expected to be the capstone of Pakistan's land-based missile force, given that its nuclear arsenal is India-centric.

However, Pakistan tested the Shaheen-3 in 2015, with a range that extends beyond the Indian territory and also encompasses Israel, Myanmar, Saudi Arabia and Sri Lanka. Asked in 2015 about the reasoning behind

the development of a missile with this longer range, Kidwai noted the growing strategic importance of the Indian Andaman and Nicobar Islands in the Bay of Bengal, while strongly suggesting that no further-reaching missiles would be forthcoming:

The Nicobar, and the Andaman Islands are very much part of India, not in main landmass, but their islands. I'm sure you know where they are, but they are being developed as strategic bases, and therefore Pakistan cannot afford to let any landmass, whether it's an island, or it's a mainland, to be out of its range. And therefore, 2,750 is a very well calculated range. And I don't particularly expect us to go beyond that, because it is now a comprehensive coverage of any particular land area that India might think of putting its weapons.³⁵

The Shaheen-3 thus appears to be intended to hold at risk Indian offshore bases and platforms, and therefore erode any advantage for India's second-strike capability, a possibility gained by moving some of its nuclear forces out of the Indian mainland.

With the Shaheen-3 as the means to deter long-range nuclear threats, another prominent new missile, the Nasr, is designed for use on or near Pakistan territory. The missile is directed at the threat of a 'Cold Start' Indian conventional advance. More theoretically, it is aimed at the underlying logic of 'Cold Start': that there is a certain dimension of solely conventional warfare that India can utilise, and that is unlikely to escalate to nuclear exchanges. As Kidwai has remarked:

Nasr, specifically, was born out of a compulsion of this thing that I mentioned about some people on the other side toying with the idea of finding space for conventional war, despite Pakistan nuclear weapons ... And Pakistan would not pick up the courage, in that kind of a scenario, to use its strategic weapons, or the operational level nuclear weapons. So it was this particular gap that we felt needed to be plugged at the lowest rung.³⁶

The Ababeel, a 2,200 km-range ballistic missile, represents another new dimension of Pakistan's diversifying nuclear force. First tested and announced in January 2017, the missile is described by Rawalpindi as the first one able to host multiple warheads, including potentially MIRVs.

The official press statement justified its technical development in terms of meeting the need for Pakistan to ensure a nuclear strike option that is able to penetrate India's BMD systems. While Pakistan's present ability to develop MIRV technology is unclear, this language strongly suggests that this is an ongoing effort for its defence scientists.³⁷

In addition, cruise missiles, such as the ground-launched Babur and air-launched Ra'ad platforms, also appear set to assume a greater role in Pakistan's nuclear posture. Pakistani officials have indicated that cruise missiles would ensure a sustained, credible nuclear strike capacity in the light of India's emerging BMD capabilities.³⁸ The Babur model is additionally likely to be assigned conventional missions, reflecting the rising importance of cruise missiles to general offensive strike planning.³⁹

Concluding this brief overview of the major trends of current Pakistan nuclear force development, we will now explore in detail their implications for the evolving deterrent relationship with India. We will first focus on the naval domain, before turning to the land theatre.

IMPLICATIONS FOR NUCLEAR INTERACTIONS WITH INDIA: THE NAVAL DOMAIN

The rapidly growing numerical size of Pakistan's nuclear arsenal, in addition to these emerging capabilities to meet perceived long-range nuclear and tactical conventional threats, would seem to be addressing the substantive conventional and nuclear threats that India may pose. However, the 'economic' threshold—the threat of naval blockade—is still an area of vulnerability to Pakistan. India's Navy outmatches that of Pakistan, and Pakistan likely has no current naval nuclear deterrent platforms in service.⁴⁰

Pakistan is now endeavouring to develop this capability. Speaking in 2008, Pakistan's then Chief of Naval Staff stated that Pakistan was 'fully capable of deploying strategic weapons on the sea, if and when the government takes such a decision'.⁴¹ A Naval Strategic Force Command (NSFC) was established in 2012, creating the logistical base for assigning future operational nuclear forces to the Navy in line with the already existing Army and Air Force SFCs. Indeed, the importance of the naval dimension to Pakistan's nuclear future is clear from statements by serving and retired officials. The press statement announcing the NSFC described it

as 'the custodian of the nation's second strike capability'.⁴² Elucidating this description, Kidwai has implied that Pakistan would not have a functioning second-strike capability until a naval nuclear force was operational, despite the greater numerical size of the Pakistani arsenal than that of India and the ability of Pakistan's land-based missile force to reach all Indian targets with the Shaheen-3.⁴³

Experts suggest that the first wave of Pakistan's sea-based nuclear force could consist of nuclear cruise missiles, such as the Babur-III, carried by its current diesel-powered conventional submarine fleet.⁴⁴ Pakistan's existing submarine fleet, consisting of two Agosta-70 and three Agosta-90B submarines, are reaching the end of their lifespans.⁴⁵ A retired Pakistan naval commander wrote in 2010 that Pakistan's Agosta-90Bs could potentially host nuclear cruise missiles 'within five years'. However, he outlined several technical issues to be addressed in order for nuclear Agosta-90Bs to be fielded: 'Missile installation and subsequent integration with the onboard combat system, as well as with the nuclear command-and-control infrastructure (C4I network), could be daunting tasks. The combat system, meant for conventional weapons, may require major changes to accommodate nonconventional weapons'.⁴⁶

In April 2015, Prime Minister Nawaz Sharif approved the purchase of eight diesel-electric submarines from China, with the deal finalised in October 2015. A retired Pakistani officer familiar with the negotiations estimated the total cost of this deal to be in the region of \$4–5 billion.⁴⁷ While the submarine model details have not been confirmed, a Pakistan official who attended a Navy parliamentary briefing in March 2015, alongside external analysts, has nominated the S-20 export variant of the Chinese Type-039A/Type-041 model diesel–electric submarine as the most likely model. A Chinese Type-041 boat visited Karachi's commercial port, close to Pakistan's principal naval base, in May 2015, while negotiations were presumably ongoing.⁴⁸

This model can feature an air-independent propulsion system, a capability already present on one of Pakistan's current Agosta 90-B submarines.⁴⁹ The system, which has not been integrated into current Indian boats, extends the possible undersea operational period of the submarine. As one scholar notes, this 'would give them a notable tactical edge over India's submarines'.⁵⁰ The Type-041 boats are also reportedly less noisy than India's Arihant SSBN, which would provide another operational advantage.⁵¹

Pakistani and external experts anticipate that this Chinese-origin submarine fleet will host nuclear cruise missiles in the future.⁵² In order to successfully mate the nuclear missiles to the submarines, there is also the possibility that China will quietly assist in the modification of the Type-041 conventional torpedo tubes.⁵³

However, while the thrust of Pakistan's seaborne nuclear deterrence creation appears to be currently based around ship-launched or sub-launched naval Baburs, other options are technically available. Pakistan currently operates seven P-3B/C Orion maritime patrol aircraft.⁵⁴ This aircraft model can carry US AGM-84 Standoff Land Attack Missiles armed with Tomahawk nuclear warheads, and Mk 101 'Lulu' nuclear depth charges. In fact, Orions in American service were assigned a nuclear mission and carried nuclear depth charges during the Cold War.⁵⁵ A retired Pakistan naval commander has suggested that 'a suitably equipped P-3C could serve as a powerful backup to an undersea second strike on board Agosta 90Bs'.⁵⁶

There are nevertheless certain vulnerabilities to using Orions as a nuclear platform. First, it is more easily locatable, and thus, destroyable by adversaries as compared to submarines. Second, its origin in US technology creates additional headaches for Pakistan defence planners. Converting Orions into nuclear strike platforms would likely constitute a violation of the conditions of the US Arms Control Export Act (AECA), under which the planes were sold. In 2009, Washington confronted Islamabad with reports that Orions were being assigned conventional land attack roles, emphasising the illegality of such a project.⁵⁷

This background would suggest an even more hostile US reaction to reports of Pakistan using Orions for nuclear purposes. This would worsen the already tense US–Pakistan political and military relationship, as recently highlighted by Pakistan's ill-fated negotiations with Washington to buy eight new F-16 Block-52 fighters. This, as with other Pakistan arms purchases from the US, has been subjected to a tortuous and public political process, complicated by Pakistan's status as a nuclear weapons state and the general mistrust in the US–Pakistan relationship.⁵⁸ For example, the chair of the US Senate Committee on Foreign Relations criticised the proposed arms agreement in February 2016, arguing that Pakistanis 'continue to support the Taliban, the Haqqani network and give safe haven to al Qaeda'.⁵⁹ Congressional opposition reached such a level that the US government informed Pakistan that no Foreign Military

Financing (FMF) programme subsidies would be made available for this deal, elevating the price from \$270 million to \$700 million. Islamabad cancelled negotiations following this development, switching its focus to an offer from Jordan to sell 14 of its less sophisticated F-16A/B fighters. As the technology is of US origin, this second agreement would still require US approval and end-use monitoring provisions. The negotiations have so far been inconclusive. Indeed, at the time of writing, Pakistan was indicating interest in reopening talks regarding the original F-16 Block-52 package with the Trump administration, thus starting the same painful cycle over again.⁶⁰

By contrast, relying upon a Chinese nuclear technology tree, as embodied by the new Chinese-origin Type-041 submarine fleet, avoids these political difficulties due to the more robust 'all-weather' China-Pakistan defence relationship.⁶¹ This technology tree extends to a third suggested potential option, involving the Chinese Xia-class SSBN, commissioned in the late 1980s.⁶² This boat has reportedly not sailed from the North Sea Fleet base near Qingdao since at least 2006.⁶³ China is instead focusing its SSBN projection upon its more modern Jin-class fleet.

This third suggested option for developing Pakistan naval nuclear deterrence is to

... plan the training and subsequent lease of a nuclear-powered submarine. The PLAN's Xia submarine could be an appropriate start. A pool of selected Pakistan Navy officers could be trained to operate an SSBN, with theoretical/academic work ashore followed by operational training at sea and finally a strategic deployment.⁶⁴

There is regional precedent for such activity; India has leased a Charlie-class SSBN and Akula-class SSN from Russia in order to provide training on how to operate a nuclear-powered submarine, and Indian sailors have also been hosted aboard the USS Annapolis Los Angeles-class SSN for the same reason.⁶⁵

However, the highly likely international discovery of a transfer of the Xia to the Pakistan Navy would attract international condemnation. If the Xia was handed over armed with nuclear weapons, it would constitute a clear Chinese violation of Article I of the NPT; the Russian submarine leases to India have included strict conditions against hosting nuclear weapons on board. Similar Chinese transfer terms might reduce the furore

of the international reaction to a Xia transfer, but would also undermine the main original purpose of the transfer, of generating Pakistan seaborne nuclear deterrence.

Still, the current Chinese approach of selling dual-use submarines enables both parties to quietly work on this task under the pretence of conventional naval force development. An outright transfer of the Xia therefore looks unlikely as of now. However, the less controversial element of this suggestion—that Pakistan sailors receive Chinese training in nuclear submarine operation—is likely to be pursued by both states, as it builds Pakistan naval deterrence, while better continuing their tradition of avoiding publicity where possible in their nuclear force cooperation.

A fourth option is for Pakistan to build its own indigenous nuclear-armed submarine fleet. However, SSBNs are some of the most complex machines invented by man, as indicated by the period of around 30 years that India required to indigenously develop and field the Arihant. This is further complicated by the fact that the Pakistan Navy has traditionally been the poorer service in military budgetary allocation as compared to the Air Force and especially the Army, a tendency that continues today and hinders present naval development efforts.⁶⁶

There have been conflicting accounts as to whether an indigenous Pakistan SSBN programme has ever been initiated. One report in 2013, from a think-tank specialising in Pakistan defence issues, claimed that the Pakistan Atomic Energy Commission (PAEC) has been engaged since 2001 in a 'KPC-3' project to develop a naval nuclear reactor.⁶⁷ However, a retired naval commander claimed in 2010 that 'no efforts to develop a sea-based nuclear capability and thus expand the survivability of nuclear forces have ever surfaced in Pakistan's policy making', and based his subsequent exploration of seaborne nuclear deterrence options for Pakistan on the premise that there was no extant indigenous programme.⁶⁸

The technical difficulty, financial cost and long project lifespan of developing an indigenous SSBN is in tension with the urgent determination of Pakistan to field seaborne nuclear deterrence. This again suggests that the purchase of eight Chinese Type-041 boats represents the main route through which Pakistan policymakers currently intend to deliver a naval nuclear force. The strategic importance of this purchase to Pakistan defence planners is underlined by its colossal expense, at an estimated \$4–5 billion, especially compared to a reported full budget for the Pakistan Navy of \$725 million in 2014.⁶⁹

However, the Type-041 purchase agreement has been structured to develop Pakistan's technical expertise of indigenous submarine construction; four of the eight boats are to be built in Pakistan with an associated technology transfer agreement.⁷⁰ While the first generation of Pakistan naval nuclear deterrence thus looks to take the shape of dual-use, Chinese-origin, diesel-electric submarines, the experience gained by constructing these boats in Pakistan can support a future indigenous SSBN programme.

A final option at this point is for Pakistan to field nuclear weapons aboard surface ships, as opposed to submarines. The successful launch test of the likely naval nuclear missile from a 'warship' in December 2012 would suggest that surface ship nuclear capability is more imminently deployable than for the Type-041 submarines, which are yet to be built. Potential candidate platforms for this surface nuclear force, carrying a Babur naval variant or nuclear-armed C-802 anti-ship missile, include: Pakistan's single US-origin Alamgir Oliver Hazard Perry-class guided missile frigate (acquired in 2011); the four Chinese-origin Zulfiqar-class F-22P frigates (commissioned from 2009–13); the two Chinese-origin Azmat-class missile patrol boats; the four indigenous Jalalat-class and Jurrat-class missile craft; and the two Turkish-origin Zarrar-class multirole fast attack boats.⁷¹

The platforms not of US origin appear more likely, again due to the greater political difficulty of converting US as opposed to Chinese technology to serve nuclear roles. In its notification to the Congress of the proposed sale of the Oliver Hazard Perry-class boat to Pakistan in 2010, the Pentagon detailed its approved Pakistan Navy role as limited to 'counter-narcotics and counter-piracy operations and to assist with Pakistan's efforts to secure its maritime border'.⁷² Pakistan has seen an effort to purchase additional Perry-class frigates fail due to hostile Congressional views towards Islamabad.⁷³ Given this context, the US political reaction to Pakistan arming its sole Perry-class frigate with nuclear weapons, in violation of AECA conditions, render its inclusion in a surface nuclear fleet unlikely.

Nuclear weapons hosted aboard recently commissioned non-US-origin surface ships therefore appear to be the most feasible immediate option for Pakistan in fielding naval nuclear deterrence, with Chinese-origin submarines to be later integrated into the naval nuclear force as these are built and commissioned. The latter will form a stronger eventual

backbone of the seaborne deterrent, due to its increased stealth compared to surface ships.

What are the implications of such a Pakistan naval nuclear force for regional security? It should first be noted that the above nuclear-capable vessels, such as the Type-041, F-22P and Azmat-class boats, represent the main elements of Pakistan's current modernisation in naval force. As these boats are commissioned and extend Pakistan naval projection, the fact that each may have a potential nuclear mission would greatly complicate Indian responses to their incursions and general strategic planning.

This generates the risk of Indian self-deterrence, as naval commanders may hesitate to confront a Pakistan vessel through concern for potential immediate escalatory consequences. This risk of self-deterrence could become associated with most of the new Pakistan Navy, due to the flexibility for multiple Pakistan naval platforms to be assigned nuclear roles. Alternatively, Indian commanders could refuse to be self-deterred and respond aggressively to perceived Pakistan incursions, generating a fast-moving escalatory scenario.

While not all of the above Pakistan vessel classes or vessels within each class may be nuclear-armed, the potential for a few to have nuclear missions produces these new strategic concerns. This could extend the 'full spectrum deterrence' Pakistan nuclear concept, and consequent Indian strategic dilemma, to the naval domain. Threatening a potential seaborne nuclear incident resulting from an Indian operation against most of Pakistan's new Navy vessels would indeed reduce the nuclear threshold to substantially lower levels of naval conventional conflict, and subsequently limit Indian conventional operational flexibility.

Indeed, these concerns are heightened by the bold intentions of the Pakistan Navy. It is first planning to field A2/AD capabilities. This is best reflected in the acquisition of the Harpoon and C-802 anti-ship missiles, which asymmetrically threaten the larger and carrier-based Indian naval fleet.⁷⁴ Pakistan had also obtained over 120 C-802s in 2012, with plans to base these on land littoral areas to enhance its A2/AD capabilities.⁷⁵ The potential, as one Pakistan nuclear expert suggests, for Pakistan to assign small plutonium-based warheads to some C-802s, overlays nuclear risk onto this already concerning A2/AD challenges for Indian strategists.⁷⁶ As with other employment of dual-use platforms, potentially dual-use C-802s can blur the nuclear threshold.

Pakistan's bold naval intentions also include a propensity for risk-taking behaviour, including a tendency in the past for Pakistan maritime aircraft to speed close to Indian boats, and for Pakistan vessels to deliberately risk collision with them.⁷⁷ Continuing such an approach, with many incidents potentially threatening nuclear implications due to the ambiguous conventional/nuclear role of the Pakistan craft involved, could maximise the effect of 'full spectrum deterrence', limiting India's ability to respond. These are the implications of Pakistan's efforts to develop a naval nuclear force that should be carefully considered by the Indian Navy and NCA, as well as integrated into the Indian official defence review that this book recommends should be conducted.

We can discern here the two major elements of the growing blurring of nuclear thresholds in the India-Pakistan-China strategic rivalry. This manifests itself first in the rising employment of dual-use platforms and delivery vehicles. This can threaten nuclear escalation of any confrontation involving an adversary unit wrongly assumed to have a solely conventional mission. An alternative consequence is increasing instances of nuclear brinkmanship through an adversary encouraging the incorrect belief that a unit is nuclear-armed. Both, in effect, could amount to a lowering of the nuclear threshold, as interference with a new generation of regional conventional naval units through their potential nuclear armament could produce nuclear implications.

The second trend is this broader extension of previously largely land-based nuclear deterrence into the naval domain. This generates the prospect of merging seaborne nuclear deterrence with Indian Ocean conventional naval competition, with potential intermingling of conventional/nuclear naval missions and strategic perceptions in a tense maritime environment with increasingly ambiguous boundaries.

In responding to these transitions, one particular point for Indian defence planners to focus on is to enhance surveillance and intelligence capabilities in order to monitor armament loading and deployment patterns for these new Pakistan vessels. This would better discern their conventional/nuclear missions based upon certain recurring tendencies in these areas. A second recommendation is to develop a naval dialogue mechanism with Pakistan to de-conflict potential patrol routes and manage standoffs that could escalate nuclear clashes.

The above challenges of seaborne nuclear deterrence in the India-Pakistan relationship are complemented by those in the land domain,

where they have fought several wars, and upon which most of their nuclear competition is conducted. It is this context to which we now turn.

IMPLICATIONS FOR NUCLEAR INTERACTIONS WITH INDIA: THE LAND DOMAIN

Pakistan has recently faced three major crises with India: the 1999 Kargil War, the 2001–02 massive twin military mobilisations following the December 2001 attack on the Indian Parliament, and the 2008 Mumbai attacks crisis. The stimulus for each of these crises was an attack upon Indian forces or territory by a militant group operating from within Pakistan's borders, aided covertly or overtly by Pakistan's defence establishment. This situation remains the most likely immediate trigger to another bilateral crisis. The frustration that drove the Indian Army to develop the 'Cold Start' concept, and which overwhelms Indian television news during each crisis, is rooted in the inability of India to halt the activities of these militant groups, and their support by Pakistan in a way that does not threaten major war with potentially nuclear consequences.

The Indian discourse of the 1999 Kargil War, occurring so soon after the 1998 South Asian nuclear tests, concentrated upon the necessity of removing the Pakistan militants and regular forces at the lowest possible level of conventional escalation. Any potential discussion of the war that even alluded to the bomb having relevance to the crisis was rendered mostly taboo. This was due to the fears of nuclear escalation, and of the reputational consequences to India's desired image as a responsible nuclear state, of even signalling with its nuclear weapons in order to support the offensive. Indian broadsheet newspaper editorial boards and commentators excoriated a rare newspaper comment calling for nuclear weapons to have a general relevance to the crisis. Crossing the LoC—the de facto border—in order to ease Indian conventional operations was also seen as too dangerous even to publicly contemplate.⁷⁸

The Kargil War had shattered the assumption among Indian analysts immediately following the 1998 nuclear tests, that a nuclear South Asia could be a more conducive environment for negotiating a final India–Pakistan peace. Echoing the 'nuclear optimist' arguments of Kenneth Waltz, Indian analysts argued that both New Delhi and Islamabad would rationally realise that the potential for another war to threaten nuclear

devastation meant that major conventional wars were no longer feasible as an option, and that differences would best be resolved through peaceful summitry.⁷⁹

Instead of validating the thinking of Waltz, the early histories of India and Pakistan as overt NWS has developed a new nuclear concept in academic literature and policy experience: the 'instability-stability' paradox. This concept accepts Waltz's point that the mutual possession of nuclear weapons renders major conventional war a more dangerous prospect to contemplate for states. However, this can also have the effect of states being self-deterred from launching a major conventional war, or escalating a smaller conflict to this level. As a state may gain confidence that the other will be self-deterred from such escalation, this can increase the chances of lower-scale conventional operations. These lower-scale conventional operations might not have been launched previously in a nuclear-free context, where the threat and costs of escalation could outweigh any initial gains from this smaller offensive. Nuclear weapons can thus generate stability at the level of major conventional war, but instability at the level of lower-scale conventional and sub-conventional conflict.

The calculus for Pakistan in continuing to permit militant groups to shelter on its territory, launch attacks on India, and even receive training from elements of Pakistan's defence establishment is that India can be destabilised through the actions of such groups. However, the attacks are still so small that India will not launch a major conventional response that could potentially open the door to nuclear war.

The 'Cold Start' concept was developed in 2004 as an attempt by the Indian Army to think of a credible response to the next Pakistan sub-conventional attack. In its effort to plan sub-conventional and limited conventional warfare that delivers real tactical, and even strategic, gains but is still several rungs down the escalation ladder from major war, 'Cold Start' enters the same sphere of thought as Pakistan's interest in sub-conventional operations.⁸⁰

The Nasr is often described by Pakistan officials as being a direct response to India's military interest in 'Cold Start' and the accordant development of rapid, limited war options.⁸¹ With the deployment of the missile, there is no conventional cross-border attack that India can plan that is 'safe' from nuclear escalation. Such a framing of Nasr as a consequence of 'Cold Start' inherently invites Nasr critics to blame Indian military adventurism for its emergence as a defensive measure.

However, there has been a suggestion that Pakistan was developing TNW prior to the development of this concept. The current Pakistan Permanent Representative to the United Nations (UN) (and former member of the Pakistan National Defence University governing body) has stated that Pakistan's 'capacity for a tactical response was already under development' prior to 'the decision to develop delivery systems for Full Spectrum Deterrence' as a response to 'the emerging Indian military posture', defined as 'proactive doctrine aimed at a rapid deployment war-fighting strategy'.⁸²

A second, less common, rationale has also been advanced, involving the Indian short-range Prahaar missile. Discussing the Nasr in 2012, an SPD official drew attention to the Prahaar, claiming that it is a tactical nuclear weapon, and that the Indian development of a tactical nuclear capability predated that of Pakistan. The intention is to suggest that India 'might have been the first in line, pulling Pakistan unnecessarily into an unending arms race'.⁸³ While this is a less frequent justification for the existence of the Nasr, it follows the same logic of attempting to originate the Nasr as a response to certain destabilising Indian behaviour, which should be the ultimate target of international condemnation.

The idea that Pakistan can and should issue a nuclear response to even low-level Indian conventional operations has been a consistent thread in Pakistan strategic messaging in recent years. As well as the verbal exchange in the wake of the India–Myanmar operation in 2015 highlighted earlier in this chapter, then Chief of Army Staff Kayani remarked in 2009 that 'Proponents of conventional application of military forces in a nuclear overhang are chartering an adventurous and dangerous path, the consequences of which could be both unintended and uncontrollable'.⁸⁴

The 60 km-range Nasr is estimated by analysts to be based upon the Chinese AR1A/A100-E Multiple Launch Rocket System (MLRS), although it has also been compared to the Chinese WS-2 and M30/M31 MLRS.⁸⁵ It is estimated to have a length of 5.4–6 metres and a 30–40 centimetres diameter. This would require a miniaturised warhead.⁸⁶ Pakistan's historical employment of HEU for its nuclear weapons extends to its 1998 test devices being all HEU-based. This means it has no plutonium warhead test data, nor the experience of developing and testing specifically miniaturised warheads, to utilise in assembling a Nasr-specific warhead. This challenge could, however, be perhaps partly eased with Chinese technical cooperation.⁸⁷

An alternative for Pakistan is to develop a small HEU-based warhead. While at least 10 US warhead model dimensions have been identified as hostable by the Nasr, experts have particularly focused upon the example of the US W-33 HEU gun-type warhead, 'simpler variants of which Pakistan has already tested', as particularly suited to the Nasr's dimensions.⁸⁸ However, while this may be a marginally easier technical pathway to a Nasr warhead due to Pakistan having at least some related test data in its possession, it leaves unaddressed the challenge of proving successful miniaturisation without actual tests.⁸⁹

Assuming that Pakistan can overcome these challenges and deploy a credible Nasr, its limited yield is likely to have an insignificant military (but not political) effect upon the major Indian conventional assault that would merit its actual use. One calculation estimates a requirement of between 257 and 436 15 kt nuclear weapons to destroy around 250 vehicles in such an assault. By comparison, the Indian Army has conducted exercises moving 1,000 armoured vehicles, and has trained for retaining cohesion and fighting through a post-nuclear environment, with the most recent exercise being conducted in April 2016.⁹⁰ This is aside from the overarching problem of India's doctrinal promise of 'massive retaliation', threatening the potential extinction of Pakistan, to even one Nasr nuclear strike.

The military case for developing a Nasr, or other short-range nuclear artillery or munitions is founded upon a felt need within Pakistan to establish asymmetric deterrence against perceived Indian conventional superiority, as further bolstered by the 'Cold Start' doctrine. However, recent studies of comparative conventional force postures have estimated a much closer balance between Pakistan and India, contrasting with Pakistan claims of substantial conventional inferiority.⁹¹ Indeed, some experts have suggested that Pakistan even enjoys some advantages over India, especially in the land theatre. Four-fifths of the Pakistan Army divisions are located close to the border with India, with a new policy introduced in 2012, which required further deployment of a quarter of battalion reserves immediately following a major terrorist attack in India.⁹²

This reserve deployment would thus occur before any Indian government decision to mobilise its own forces against Pakistan, and this Indian decision would likely be taken only following a time-consuming process of correctly identifying the perpetrators, and acquiring and confirming solid evidence of their connections to Pakistan. Evidence

of actual subsequent Indian mobilisation would only flood additional Pakistan forces and reserves towards the border, continuing Pakistan's geographic and temporal advantage in the ground balance against India through this next stage.

In addition to these advantages, Pakistan has been conducting major tri-service conventional field and planning exercises to train specifically to resist a 'Cold Start'-like attack. Four *Azm-e-Nau* ('New Resolve') exercises were conducted from 2009–13. The first stage of each exercise constituted scenario development and related contingency planning. The second stage involved testing these planned contingency responses in the field. Based upon the performance in the early exercises, the military reportedly revised its doctrinal approach to this challenge in 2011, adopting the aforementioned rule requiring the early deployment of a quarter of battalion reserves, before continuing.⁹³ The final exercise, *Azm-e-Nau IV*, was conducted in late 2013, with integrated armour, artillery, air defence and civil aviation capabilities, alongside the deployment of the F-7P, F-16, JF-17 and Mirage aircraft.⁹⁴

Upon conclusion of the entire series, Pakistan officials claimed that the armed forces had demonstrated successful mobilisation in a shorter timeframe than that achievable by India.⁹⁵ An assessment published on the Pakistan military website, titled 'From Cold Start to Cold Storage!' concluded that the series had proven that the armed forces were 'equally effective and vigilant along the Eastern front despite being heavily committed in their fight against the terrorism along the Western borders', with 'massive firepower available with Pakistan Army to meet any future challenge'.⁹⁶ Given that the conventional doctrinal redesign of 2011 appears to have been successfully validated, thereby assuring Pakistan's conventional deterrence, it raises the question as to why a Nasr-like battlefield nuclear capability is still required.

Employment of the Nasr would indeed complicate Pakistan's response in several ways. First, deployment of the Nasr to the field raises the question of pre-delegating launch authority to field commanders. If the Nasr is tasked to respond to what will be a fast-moving conventional attack, delays in launch authorisation could reduce its utility. However, assigning such authority to local commanders could lead to a decision to launch based upon incomplete information, and in a context of extreme local pressure, but where the relevance of the conflict for Pakistan's overall future is still unclear.⁹⁷

Due to their limited range, Nasr missiles will need to be deployed close to the fighting. The proximity of the missiles to enemy forces means that the risk of their capture or destruction can be very high; indeed, a retired Indian Army brigadier has noted that for Nasr systems to be able to target an Indian armed offensive, they will have to be placed within the range of Indian multiple rocket launch systems such as the Pinaka.⁹⁸

However, this generates another dilemma for local commanders, described as the 'use them or lose them' problem. Should their imminent destruction appear to be a growing risk during the conflict, field commanders may feel pressure to fire the missiles to prevent their loss, as well as to attempt to turn the tide. Perceived risk of imminent destruction of the Nasrs would also require their frequent movement and relocation, heightening the risk of their interception. This would also require protection details that would remove Pakistani forces from the total available for the actual conventional fighting. Finally, the context in which the Nasr would be used—an Indian limited cross-border operation—would already signify its failure to deter, as Indian forces would have entered Pakistan territory, already aware of the missile's existence.

Despite these issues, there are no signs that Pakistan has reconsidered its plans to develop TNW. As the centrepiece of Pakistan's 'full spectrum deterrence' nuclear concept, deployment of the Nasr is intended to lower its nuclear threshold with India. However, India refuses to accept that this threshold has been lowered, with the Indian Army conducting exercises to fight through a nuclear strike, and continued emphasis on India's refusal to countenance tactical nuclear warfare. This interaction—or lack of interaction—between Pakistan and Indian conceptions of their bilateral nuclear threshold amounts to increasing ambiguity as to where precisely it lies on the bilateral spectrum of conflict. Indeed, the general stage in a conventional conflict at which Pakistan would consider nuclear first-use remains unclear even to well-connected Pakistan analysts and nuclear experts.⁹⁹ Second, the nature of the Nasr as nuclearised artillery represents another example of the rising employment of dual-use platforms in regional nuclear force development, further blurring nuclear thresholds.

The thinking behind the multiple-warhead Ababeel missile represents another challenge for South Asian deterrence. In its inherent threat to place a greater number of Indian targets at risk, the emergence of this new missile will generate additional pressures on India to expand its nuclear force size to assure its continued reliability, as well as enhance readiness.

If India adopts these measures, they could in turn stimulate further efforts by Rawalpindi to augment its nuclear forces.

These developments will render the India–Pakistan strategic rivalry more complex and suggest conditions conducive to accidental and inadvertent escalation. Of the above developments, inadvertent escalation could particularly be delivered by a certain operational movement of Nasr missiles that is interpreted as a nuclear threat; of major Indian conventional units that are interpreted as preparing for a ‘Cold Start’ attack; or by attempted conventional interdiction of an adversary naval vessel that is nuclear-armed or escorting another nuclear-armed vessel. Accidental escalation could be delivered through political crisis decisions based upon the current readings of adversary territorial red lines (on land or at sea), conventional damage tolerances and nuclear threshold locations, which vary from those declared by the adversary.

Indeed, these concerns join a previous track record of misperception conducive to accidental and inadvertent escalation. During the 2001–02 crisis, the commander of India’s 2 Corps reportedly directed a third of his total forces to within 25 miles of the border with Pakistan, from their previous location around 90 miles away. A defence analyst claims this was an operational misinterpretation of the ambiguous rules of engagement set by the Cabinet Committee on Security (CCS). This could have appeared to Pakistan as preparation for an imminent strike, and therefore generated an escalatory response.¹⁰⁰ The Chief of Army Staff and Chief of Naval Staff later claimed that the rules of engagement as set by the CCS were far from clear during the crisis.¹⁰¹

At the height of the crisis, India’s Chief of Army Staff stated to journalists that if Pakistan were to use nuclear weapons, the Indian nuclear response would ensure that Pakistan was ‘punished so severely that (its) continuation thereafter in any form of fray will be doubtful’, and he also remarked in the same press engagement: ‘If we go to war, jolly good!’. These statements were not authorised by Indian political decision-makers, and could have been interpreted by Pakistan as containing escalatory significance.¹⁰² Another example of the risk of unplanned escalation based on adversary misperception was provided in the Kargil War, where Prime Minister Sharif was unaware that the military was preparing nuclear weapons, a development that could have stimulated an Indian escalatory response.¹⁰³

Another recent example has also been provided in the Mumbai attacks crisis starting in late November 2008 and continuing into early 2009.

While bilateral strategic tensions were very high immediately following the attacks, an Indian surveillance plane flew near the LoC and was perceived by Pakistan as entering its airspace. Pakistan responded by launching the F-16 aircraft to intercept the Indian plane. The IAF needed to conduct an internal inquiry to determine what had happened, which found that the Indian aircraft involved had been operated by the Research and Analysis Wing intelligence agency, not the IAF.¹⁰⁴

Pakistan's evolving nuclear doctrine and posture, as it interacts with that of India on the land vector, therefore offers little optimism for greater stability in their strategic relations in the years to come. The blurring of conventional and nuclear thresholds, as both states harbour different ideas about where the threshold should be, is particularly concerning. A second form of this blurring is in the growing prominence of dual-use platforms and the resultant difficulty of discerning the conventional or nuclear mission of an adversary force concentration. Indeed, as we will see, blurring of conventional and nuclear thresholds and platforms is a broad emerging theme of the India-Pakistan-China nuclear triad.

CONCLUSION

These challenges emphasise the need for broadening nuclear strategic dialogue between India and Pakistan, to discuss the implications of the Nasr missile, develop an understanding of comparative naval conventional and nuclear perceptions, and also develop procedures to manage potential contingencies. This will help reduce tensions and render the resolution of a standoff more achievable, as compared to improvising responses entirely in situ. However, for such a dialogue to be effective, it must also fully include China as the third member of this triad. Moreover, the above developments must be incorporated into a public Indian official defence review that: conducts a threat assessment; evaluates the feasibility and credibility of conventional and nuclear force development and deployment programmes to meet the specific threats identified; and reiterates only the credible military role of nuclear weapons as a tool to prevent the dissolution of India as a territorial entity, assigning all other threat responses to conventional forces.

China is the third member of this interlocking nuclear triad, and we will now turn to its historical and evolving role in regional nuclear dynamics.

As we will see, the central trends of the India–Pakistan–China triad in the early twenty-first century—the blurring of perceived doctrinal thresholds and of operational thresholds through the rising employment of dual-use platforms—resurface in recent Chinese nuclear behaviour and its effects within the region.

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Chinese Nuclear Thought and Posture

Implications for India

The implications of power differentials characterise the India–China relationship, much like the India–Pakistan relationship. However, here, India is in the inferior position. While India and China have similar population sizes, China's economy and military–technological sophistication is much greater. While the lacerating experience of the 1971 War infuses Pakistani anxieties about India today, India suffered a humiliating defeat to China in a short bilateral war in 1962. China claims most of a whole state of India—Arunachal Pradesh—as its own; it upholds other disputed territorial claims in the Ladakh and Aksai Chin regions. India has only recently begun upgrading roads on its side of the border, overcoming a previous concern that good roads could only ease the southward path of another Chinese invasion.

As India presently enjoys the ability to hold the entire Pakistan territory at nuclear risk, substantive energies within India's nuclear thought and planning today are directed towards achieving a similar goal against China. In a leaked letter to President Clinton explaining the 1998 nuclear tests, Indian Prime Minister Atal Bihari Vajpayee referred to the threat posed by 'an overt nuclear weapon state on our borders, a state which committed armed aggression against India in 1962', as a primary cause of the Indian decision to develop an overt nuclear force.¹ India's most recent missile, the Agni-V, has been developed with Chinese east coast targets in mind.² India's emerging Arihant-class nuclear-armed submarine fleet is designed to ensure second-strike capacity. But it is also often spoken about in India as an additional signal of naval resolve against Chinese conventional projection into the Indian Ocean.³

Chinese nuclear threat perceptions primarily revolve around the challenge of deterring its more powerful geopolitical rival—the US—rather than its inferior rival, India. This tendency forms a regional pattern, with

Pakistan principally concerned with deterring India as the superior rival, and India similarly with deterring China. China practices a no-first-use policy and nuclear posture that rely substantially upon deception and mobility for a limited number of weapons to ensure deterrence, rather than numerical strength as in the American and Russian traditions.

To address its anxieties about the potential of American ballistic missile defence systems to block Chinese nuclear retaliation, China is reportedly developing MIRV technology. This technology will be used for its missiles, alongside anti-satellite strike capabilities in order to degrade supportive infrastructure for adversary ballistic missile defence systems. China is also fielding a nuclear-armed submarine fleet, and emphasising the use of conventional nuclear-capable ballistic and cruise missiles in its power projection. While the US is still the greatest external influence on China's nuclear force development, a 2015 Pentagon report noted that India's nuclear force advancements are an 'additional driver' for those of China.⁴

This chapter will first explore China's tradition of nuclear thought. It will then investigate Chinese conventional force advancements in the land and naval domains of competition with India, and how these developments are affecting Indian nuclear threat perceptions. It will conclude by examining recent Chinese efforts to build Pakistan's nuclear and general national infrastructure for military mobilisation.

CHINESE THREAT PERCEPTIONS AND EFFECTS ON NUCLEAR DOCTRINE

The history of China's nuclear weapons programme has not been principally influenced by insecurities in its relationship with India. Instead, China's interest in nuclear weapons originated in a desire to attain great-power status, as well as to deter the US. The US and, to a lesser degree, the Soviet Union/Russia, has occupied the majority of China's nuclear threat perceptions, and has shaped its nuclear force.⁵

The early Chinese nuclear weapons programme was characterised by the belief that China's leaders, even without nuclear weapons, were less afraid of their use than the US. This attitude, that nuclear weapons were less consequential in actual war than assumed by American policymakers, would create better cognitive and political flexibility for Chinese policymakers in the domestic propaganda to withstand American

nuclear threats and even nuclear use in a conflict. Attaining a Chinese nuclear weapons capability, in increasing the complications for US policymakers considering any prospective nuclear attack upon China, would further strengthen Chinese security against such an attack. This initial approach has been described as 'counter-nuclear blackmail', rather than the deterrence based upon nuclear retaliation that was the goal for early nuclear weapons programmes in other states.⁶

Following from this belief that the US is more prone to self-deterrence by the threat or use of nuclear weapons as compared to China, China's nuclear force development has more recently been focused not upon generating first-strike primacy, but rather on a nuclear force adequate to create enough uncertainty within the minds of adversary policymakers regarding their ability to conduct a first strike that obliterates any prospect of Chinese nuclear retaliation. As a Chinese analyst has described this thinking, 'What's the threshold of first strike uncertainty to deter? The basic question ... is: "how uncertain is enough?" as opposed to the classical question in the Cold War: "how much is enough?"'⁷

China's nuclear force, conceptually built upon generating uncertainty in the minds of adversary leaderships, is a fraction of the numerical size of that of its two primary nuclear targets—the US and Russia. China has the technological and economic capacity to field a much larger nuclear force. This means that this comparatively small size of China's nuclear force, plus its reliance upon mobility and deception, are truly determined by doctrinal thinking rather than the technological or economic limits to nuclear force capabilities often faced by young nuclear weapons programmes.

China's nuclear doctrine was most recently concisely outlined in a 2015 defence white paper:

China has always pursued the policy of no first use of nuclear weapons and adhered to a self-defensive nuclear strategy that is defensive in nature. China will unconditionally not use or threaten to use nuclear weapons against non-nuclear-weapon states or in nuclear-weapon-free zones, and will never enter into a nuclear arms race with any other country. China has always kept its nuclear capabilities at the minimum level required for maintaining its national security.⁸

Compared to India and Pakistan, the Chinese doctrine is notable in that it describes its doctrine as 'minimum', without the careful qualifier

of 'credible' that characterises the Indian doctrine of 'credible minimum deterrence', and in contrast to Pakistan's march in the other direction, towards 'full spectrum deterrence'. China is also the only state among the three to regularly issue public official statements of its nuclear doctrine in white papers.

However, China's nuclear thinking is not universally as minimalist as highlighted in the above doctrinal statement. There has been a Chinese military debate since the 1980s regarding whether nuclear force planning should continue to adhere to a 'minimum deterrence' posture, or transit to a more flexible 'limited' deterrence. The essence of the 'minimum' deterrence posture is ensuring sufficient retaliatory capacity with the lowest warhead count and quantum of destructive capability possible. This also involves countervalue (adversary population centre) target selection, an option that the 2013 iteration of the authoritative Chinese Academy of Military Sciences manual, *Science of Military Strategy*, identifies as requiring numerically smaller, less precise and lower-yield nuclear forces as compared to counterforce (adversary military) targetting.⁹

The latter posture of 'limited' deterrence would entail constructing this counterforce nuclear warfighting capacity, with comparatively larger, more precise and higher-yield nuclear forces. This would also involve greater diversification of nuclear platforms to build different nuclear force options for each domain (land, air and sea), and in turn escalate the level of nuclear conflict. The manual rejects this latter approach, suggesting that 'minimum deterrence' remains the organising concept of China's nuclear posture.¹⁰

However, pressures to adopt a form of limited deterrence still exist in China. As we will see below, a new generation of Chinese ballistic missiles is being developed, which are MIRV-capable and more precise, compared to those currently deployed. More focused targetting options are also being delivered through advancements in Chinese space-based surveillance, communications and geolocation capabilities.¹¹ These create new counterforce options for China, which could render a limited deterrence approach more technically feasible, and thus, less of a distant concept than in the past.¹²

These Chinese efforts to develop more precise, multiple-warhead nuclear forces primarily emanate not from a perceived Indian threat, but from concerns regarding a perceived US potential capability to successfully conduct a nuclear first strike. This potential is generated by the numerical superiority of US nuclear forces; the increasingly sophisticated ballistic

missile defence technology being deployed by the US and its allies around China's periphery, potentially blocking Chinese nuclear retaliation; a high degree of adversary targetting precision delivered by the unparalleled sophistication of US missile and space-based global positioning technologies; and growing US interest in developing conventional precision strike options, such as the Prompt Global Strike conventional ballistic missile packages.¹³ The latter development, in particular, should not be overlooked in understanding Chinese nuclear threat perception; the *Science of Military Strategy* warns:

The 'rapid global strike' plan currently being put into effect by the United States, as soon as it takes shape as an actual combat capability, will, when used to carry out a conventional attack against our nuclear missile forces, put us into (sic) a passive position, greatly influencing our capability for nuclear retaliation, weakening the efficacy of our nuclear deterrence.¹⁴

Another area of Chinese 'minimum deterrence' nuclear practice under discussion concerns alert procedures. Chinese nuclear forces, as with those of India, have traditionally been stored in a 'de-alerted' format, with warheads and missiles held separately. This has been viewed as an element of the 'minimum deterrence' philosophy of eschewing policies implying a high degree of military readiness that would resemble a nuclear warfighting approach. The Chinese anxiety regarding a US first strike, however, is also driving discussions on this practice. The *Science of Military Strategy* suggests that nuclear forces could be held on a higher alert level, ready to launch only upon receipt of intelligence of an incoming nuclear strike:

When conditions are prepared and when necessary, we can, under conditions confirming the enemy has launched nuclear missiles against us, before the enemy nuclear warheads have reached their targets and effectively exploded, before they have caused us actual nuclear damage, quickly launch a nuclear missile retaliatory strike.¹⁵

Launching a nuclear attack before China has suffered one would appear to contravene China's no-first-use commitment, but the manual guarantees that this launch would only occur following the receipt of irrefutable intelligence 'confirming the enemy has launched nuclear missiles against us'. As an American expert has noted, it may be impossible

to ever determine that an incoming missile is definitively nuclear-armed prior to its impact.¹⁶

Nevertheless, military interest in effecting such a shift towards launch-on-warning persists. This extends to the development of a study on options for building an attack-warning network in 2014, reported plans to explore space-based early warning sensors, and a commitment to 'improve strategic early warning' in the 2015 defence white paper.¹⁷

CHINESE NUCLEAR PERSPECTIVES OF INDIA

In their views of the nuclear threat hierarchy facing the country, Chinese officials and members of its strategic community continue to rank India substantially below the US and Russia. This is primarily due to the currently limited technical capabilities of India's nuclear force, as well as the absence of any perceived intentions in New Delhi to launch an attack against China.¹⁸ However, there are signs of shifts within the Chinese nuclear discourse on India, driven by the increasing credibility of Indian nuclear and nuclear-capable delivery vehicles, and its deepening strategic partnership with the US. Particular areas of focus include: an understanding of the significance of India's emerging delivery vehicles, such as the Agni-V and Arihant, for China's strategic environment, and the prospect of India's enhanced abilities to expand fissile material stockpiles and benefit from close US military cooperation following the conclusion of the civil nuclear agreement. While these recent reassessments of Indian strategic capabilities have not yet been translated into new Chinese nuclear diplomatic and military approaches towards South Asia, they could nevertheless compel such a revision in the future.

The emergence of new Indian nuclear and nuclear-capable platforms have drawn interest from Chinese analysts. A survey of Chinese literature regarding Indian military posturing has evidenced substantial commentary regarding the Arihant and Brahmos platforms, including their positive effects for India's defence projection.¹⁹ The range, destructive capacity and meaning of new force developments for India's military rise have also been evaluated in the recent People's Liberation Army (PLA) Academy of Military Sciences commentaries. One study has remarked upon the multiple-warhead potential and testing progress of the Agni-V and prospective Agni-VI missiles, noted their ability to reach major Chinese

east coast population centres, and highlighted the importance of these developments for India's military rise. The commentary drew attention to the future prospect that miniaturised multiple warheads being hosted aboard an 8,000 km-range Agni-VI could be a substantive landmark in India's strategic force posturing. This article also concluded that these new platforms would contribute to pressures within India for a strategic nuclear dialogue with China.²⁰ Another Academy of Military Sciences report has surveyed the Agni-IV, Agni-V and Arihant programmes, illustrating their contributions to developing a more credible Indian nuclear force, and predicting that they would influence a greater boldness on the part of New Delhi in pursuing its Indian Ocean and broader national interests.²¹

Chinese experts have also studied the implications of the US–India nuclear deal for China's strategic context. Significant concerns include risks that India may now be able to increase its fissile material production, including that for military purposes.²² Another point made is that New Delhi will now benefit from greater comparative access to global military technologies than China, as well as a deepening defence partnership with the US. These developments could further complicate China's regional environment and, in turn, narrow its military edge against India.²³

The Chinese discourse on India has also evidenced debate regarding the continued commitment of New Delhi to its 'no-first-use' policy. The description of the no-first-use pledge as 'no first use against non-nuclear weapon states' in 2010 by the then NSA Shivshankar Menon was quickly dismissed as an incorrect mischaracterisation of the policy within India, and some descriptions of the pledge refrain from mentioning this caveated version.²⁴ Still, the 2010 iteration of the no-first-use policy has been described by a Chinese expert as continuing to inform perceptions of India's nuclear doctrine within China.²⁵ Threat assessments based around this reading of a conditional no-first-use pledge would entail an Indian interest in first-use against China and Pakistan, and accordingly, in a larger and longer-range nuclear arsenal, held at a higher degree of readiness. As discussed in Chapter 1, recent Indian force developments could be interpreted to conform to this conclusion. The combination of canisterised Agni-V and prospective Agni-VI missiles, an Arihant-class SSBN fleet, and the continuing absence of visible political limits to Indian nuclear force development reflects the emergence of this posture characterised by increased permanent readiness.

The evolving India–Pakistan strategic rivalry and its implications for regional nuclear stability have also attracted commentary in China. One Chinese scholar, again reflecting upon the 2010 version of India's no-first-use pledge, has suggested that India would probably seek to retain the option of first-use of nuclear weapons against Pakistan in a conventional conflict, including striking nuclear targets.²⁶ This perception would be reinforced by recent discussions in India regarding the potential existence of a pre-emptive nuclear counterforce strike policy against Pakistan, as discussed in Chapter 5. A RAND investigation of Chinese strategic opinion has highlighted that the Indian development of such limited nuclear war capabilities could motivate Chinese security planners to adopt similar plans, even if both states continue to formally adhere to their stated no-first-use doctrines. As this study suggests, 'Should India deploy a broad range of warfighting capabilities, Chinese military planners might fear that China could potentially face an Indian foe capable of using nuclear weapons to win battlefield victories.'²⁷

A related concern is the potential future prospect of India attaining nuclear parity with China, as the former continues warhead production and the development of longer-range delivery vehicles. The recent RAND analysis of Chinese strategic opinion found that multiple sources felt China would not permit India to reach this benchmark, suggesting potential further expansions in China's arsenal as a reactive measure to this situation.²⁸ This outcome would represent the emergence of a closer interactive sensitivity of Chinese and Indian nuclear planners to their perceived mutual posturing intentions, which could threaten to introduce arms race dynamics.

These facets of Chinese strategic thought towards India align with the more challenging nuclear strategic environment identified in the *Science of Military Strategy* manual.²⁹ Several Chinese experts, including a retired general, have noted the emergence of a strand of opinion within China that favours revoking the no-first-use pledge and assigning nuclear forces a broader role in general deterrence. While this is still a comparatively small segment of opinion, it is shared by sections of the military.³⁰ The former officer notes that these arguments are partly based upon views that 'nuclear weapons continue to spread among China's neighbours' despite the no-first-use policy, and that 'the situation involving China's neighbours seems to be deteriorating'.³¹ A continuation of this negative trendline in China's evaluation of its regional security could stimulate

further support for this hawkish school of Chinese nuclear strategy. Further Indian strategic force advancements, and evidence of new defence cooperation initiatives with the US, could therefore increasingly pressure China towards doctrinal and posturing changes, flexible response and associated new warfighting options.

These perceptions, and their accordant recommendations for Chinese policy responses, could be further amplified by transitions in China's strategic policymaking structures. As highlighted above, the military forms a notable element of the constellation of support for the doctrine and options for Chinese flexible response. Structural empowerment of the military within China's nuclear policy complex could therefore enhance the weight of these perceptions and voices within policy deliberations. Indeed, 'The day-to-day supervision of top leaders has declined since the 1960s and 1970s, and the role of the military in nuclear policymaking has grown', while the 'elevation of the Second Artillery from branch to service (with its name change to PLA Rocket Force) will strengthen nuclear advocacy within the PLA'.³²

This overview of Chinese perceptions of India illuminates the increasing incompatibility between the evolving threat that India poses to China, and China's strategic responses to this threat. Despite these transitions in the Chinese discourse, at the policy level, Chinese security managers continue to publicly and privately prioritise India as a minor concern in their strategic evaluations. Beijing continues to refuse New Delhi's entreaties for a bilateral strategic nuclear dialogue, as this would reflect an official recognition of India as a *de facto* nuclear power.³³ Chinese diplomats continue other efforts to seek to delegitimise India's nuclear status, such as hindering its campaign for NSG membership. Another recent initiative has been to claim that the emergence of the Agni-V violates United Nations Security Council (UNSC) Resolution 1172, passed in 1998 to condemn the South Asian nuclear tests, and demand that India and Pakistan desist from further weaponisation and ballistic missile development.³⁴

Indeed, a close analysis of China's reactions to the December 2016 Agni-V test highlights the extent to which this policy approach towards India is counterproductive for its regional security interests. The Ministry of Foreign Affairs paired the above UNSC violation claim with a call for 'strategic balance' between India and Pakistan.³⁵ This 'balance'-framing justifies China's continuing efforts to bolster Pakistan's nuclear force capabilities, including the sharing of submarine and multiple-launch

rocket system technologies, as identified in Chapter 2. Indeed, a retired Second Artillery Corps official has claimed that China will begin new ballistic missile cooperation initiatives with Pakistan following the Agni-V test. This move was denied by a Chinese foreign affairs spokesperson, but was nevertheless reported in the Indian media.³⁶

Despite the fact that Chinese defence publications and discourses highlight the above developments in Indian force modernisation and US–India relations as significantly complicating China's threat environment, Beijing's current policy attitude towards India can only serve to maintain, if not accelerate, these trends. Refusing to diplomatically engage India in nuclear strategic stability, while enabling Pakistan's arsenal growth, can only further propel India towards fielding a nuclear force that is closer to parity with China.

Recognising this dilemma, some Chinese scholars have begun to call for a revision of China's approach towards India. One expert has proposed a strategic nuclear dialogue with India, as, 'To no small extent, India's distrust of China's nuclear policies has driven India's nuclear weapons development. A regular bilateral dialogue is the only way to gradually reduce misunderstanding and build confidence.' This suggested dialogue could incorporate mutual nuclear threat perceptions, doctrinal and posturing principles, and delivery vehicle development, as well as broader topics such as the nuclear non-proliferation regime.³⁷

Another recommendation by a Chinese academic is for a new approach towards nuclear force transparency. As China has traditionally hosted a comparatively small nuclear arsenal to that of the US, its survivability has partly relied upon opacity, deception, and mobility regarding the precise constitution and locations of its forces. Beijing has accordingly refrained from outlining details of its nuclear force size and shape in its multilateral dialogue with those NWS that are under the NPT, a tendency also reflected in its bilateral engagements with Washington.³⁸ A diplomatic statement of China's approach towards nuclear transparency has asserted that more advanced military powers should have greater transparency obligations than rising military powers.³⁹ However, a Chinese professor has argued that Beijing should nevertheless adopt new unilateral transparency measures, as 'The lack of transparency is damaging to China's national image. In the context of China's rising strength, a good national image is very important for promoting mutual trust among nations and achieving a peaceful rise.'⁴⁰

This recommendation would entail the issuance of a defence white paper, with the following details:

This white paper should at least contain an upper limit to the number of nuclear warheads that China possesses—that is, no more than 300 or 500. This document should also announce that China has stopped producing fissile materials for use in nuclear weapons, and that China has no tactical nuclear weapons. It also should release the names of all of China's nuclear weapons, clarify that the country's short-range ballistic missiles are not being used for nuclear purposes, clarify whether the country's cruise missiles are only being used for conventional purposes or if they could also be used for nuclear purposes, and clarify whether it still has bombers carrying active nuclear weapons.⁴¹

Further measures, as outlined under this proposal, could also involve public notification of missile tests, including the missile model, launch and landing locations, scheduled date and time of the test, and outcome.⁴² These recommendations could certainly reduce Indian threat perceptions of China, and aid in building mutual trust and correcting potential worst-case scenario projections in New Delhi regarding Chinese nuclear intentions and capabilities. Moreover, as China is the superior power in relation to India, these efforts would enact China's own expressed principle regarding the greater responsibility of more militarily capable states in establishing transparency initiatives.

Nevertheless, there are few signs that these recommendations on Indian nuclear dialogue and transparency will become official policy in the near term. Chinese strategic discourse is increasingly cognisant of India's military nuclear capabilities, but assessments of the threat posed by India has not yet reached a point, in the eyes of Chinese officials, to compel a revision of its current policy approach towards South Asia. Each element of this policy framework, including assisting Pakistan's nuclear force expansion, delegitimising India's nuclear status, and resisting strategic dialogue or transparency measures with India, motivates Indian development of a larger, more sophisticated and longer-range nuclear force, as well as closer strategic ties with the US. These Indian responses could amplify existing pressures within China for a larger nuclear force and a more flexible doctrine. Such Chinese policy outcomes would further elevate Indian threat perceptions, and potentially stimulate

similar doctrinal and posturing transitions within India. Based upon the interactive effects of shifts in Indian and Chinese strategic thought and policy behaviour, there is growing evidence of conditions conducive to more heightened nuclear competition, including an increased interest in flexible response and limited nuclear war strategies.

As these Chinese debates progress, Beijing is building a new generation of potentially higher-yield nuclear weapons with more accurate targetting; and military analysts are exploring the possibility of raising the permanent alert level towards launch-on-warning. The next section will explore the present Chinese nuclear posture in this context, focusing particularly on specific implications for India.

CHINA'S NUCLEAR POSTURE

China has been estimated to hold around 260 nuclear warheads in 2018. China's nuclear posture relies heavily upon land-based ballistic missiles, although it is presently developing a nuclear-armed submarine fleet. Like India and Pakistan, China still stores warheads separately from delivery vehicles during peacetime. However, China's intention to field a nuclear-armed submarine fleet will require sea-launched missiles to be fully armed before deployment. China, India and Pakistan, therefore, all face this policy challenge in the coming years: of managing the civil–military and operational issues that arise from deploying fully-armed nuclear weapons, and the accordant delegation of authority to launch them.

Table 3.1: Chinese Nuclear Forces, 2018⁴³

Delivery Vehicle	Range (km)	Status
Aircraft		
H-6 Aircraft	3,100	Inducted
Land-based Ballistic Missiles		
DF-5A	13,000 +	Inducted
DF-5B	12,000	Inducted
DF-31A	11,200 +	Inducted
DF-4	5,400 +	Inducted

(contd.)

(Table 3.1 continued.)

Delivery Vehicle	Range (km)	Status
DF-31	7,200+	Inducted
DF-3A	3,000+	Inducted
DF-21	1,750+	Inducted
Cruise Missiles		
DH-10	1,500	Inducted
DH-20	Unknown	Unknown
Sea-based Ballistic Missiles		
JL-1	1,000+	Inducted
JL-2	7,400	Inducted

IMPLICATIONS FOR NUCLEAR INTERACTIONS WITH INDIA:

THE LAND DOMAIN

While land-based nuclear missiles have long held the range to target the Indian mainland, these are being replaced with a new generation of more accurate and potentially more destructive missiles. Chinese land-based nuclear forces are divided into six missile bases, although these have alternately been described as units. Analysts suggest that Chinese nuclear missiles intended for Indian targets are principally located at sites under the aegis of the 53rd Base in Yunnan province in southwest China, and under the 56th Base in Qinghai province in the northwest.⁴⁴

The 53rd Base reportedly holds nuclear-capable 1,750 km-range DF-21 ballistic missiles. Experts have observed that India is the only nuclear-armed state that the DF-21s stationed at Kunming under the 53rd Base can reach. The 3,000 km-range DF-31A missiles and DF-21s have been assigned to the 56th Base. In addition, 13,000 km-range DF-5A and 5,400 km-range DF-4 missiles are stationed at the 54th Base in Henan province and 55th Base in Hunan province.⁴⁵

Adjustments to this nuclear missile force emphasise improvements in accuracy, mobility and destructive capability. China is increasing the number of warheads carried aboard its nuclear missiles, reportedly equipping around 10 of its 20 DF-5A missiles with MIRV-warheads.⁴⁶ There may be a prospect for further advancements in this direction,

with one analysis suggesting that the DF-31 has successfully been tested carrying multiple warheads in the past, and that DF-31 missile variants could be replaced with MIRV-capable versions in the future.⁴⁷ China is also experimenting with potentially nuclear-capable hypersonic glide vehicles, designed to evade ballistic missile defence systems; a successor to the DF-21 is a likely candidate missile to carry this new vehicle.⁴⁸

DF-4 rockets, which are reportedly stationed in relatively fixed sheltered locations, are being gradually replaced with road-mobile DF-31 missiles. China is increasing its number of DF-21 road-mobile missiles, including the introduction of conventionally-armed DF-21s that blur the line between nuclear and conventional missile strike missions for analysts outside China.⁴⁹ These advancements are underpinned by China's growing communications, targetting and geolocation capabilities, which will improve accuracy. India appears set to face a Chinese nuclear missile threat in the coming years that is increasingly road-mobile, MIRV-capable, precise and ambiguous in constitution, with growing potential for nuclear-capable ballistic missiles to be assigned conventional missions, and vice versa.

Ambiguity regarding China's nuclear future has also been generated by the announcement on 31 December 2015 of the most far-reaching Chinese military reforms in generations. One specific reform replaced the Second Artillery Corps, hitherto responsible for China's nuclear and conventional ballistic missile operations, with a new Rocket Force. This Rocket Force has been formally elevated to the status of a full military service, on the same level as the Army, Navy, and Air Force. A new separate Strategic Support service, reportedly responsible for reconnaissance and cyber and space war, has also been created at this same level.⁵⁰ This adjustment formalises the *de facto* treatment of the Second Artillery Corps as an 'independent branch treated as a service'.⁵¹

However, this particular reform may entail more than a name change. The Ministry of National Defense explained the formation of the Rocket Force as 'representing the core strength of the Chinese military to provide strategic deterrence and strategic support on a par with China's status as a great power', and that the new service was intended to 'build a stronger and modern missile force in line with its functions and missions'.⁵²

Indeed, alongside advancing with the missile modernisation programmes outlined above, the Rocket Force is also tasked in its early life with new measures to improve missile reliability. Reports published on a PLA website claimed that Rocket Force tests of short-range ballistic

missiles were conducted in February 2016, in a desert area in northwest China and in a tropical forest in the south. The northwest desert tests were stated as being conducted at a temperature reaching 30 degrees Celsius (-22 degrees Fahrenheit), and as potentially including the 600 km-range nuclear-capable DF-15 missile.⁵³ Most DF-15s are currently assessed by external analysts to be assigned conventional strike missions.⁵⁴ An IAF Group Captain has claimed that conventionally-armed DF-15s are stationed at Chengdu, targetted against India, although this has not been confirmed by other experts.⁵⁵

An earlier series of tests, also emphasising low-temperature launch conditions, was conducted in January 2016. This selection of launch conditions is notable, given that the location of Qinghai province, where the 56th Base is located, is mostly on the Tibetan plateau. The official China Central Television (CCTV) network reported that the tests 'developed over 10 new tactics for snowfield combat, including rapid mobility methods and tactics to avoid airstrikes'.⁵⁶

A second recent measure has been to construct a new missile training facility, announced in February 2016. The PLA claims that this facility can simulate launch conditions of 'rain, snow, galeforce winds, fog and lightning, as well as electronic warfare situations'.⁵⁷ The Rocket Force is therefore dedicating itself to improving the usability as well as technical sophistication of its missile forces, with a particular early focus on tests under environmental conditions similar to that of its bases, likely to be assigned India targetting missions.

It remains unclear whether the Rocket Force will receive greater responsibilities as compared to its Second Artillery Corps predecessor. The Second Artillery Corps controlled land-based nuclear and conventional ballistic missiles, with air-based and sea-based nuclear forces under the management of the Air Force and Navy, respectively. It is uncertain as to whether the Rocket Force will now assume responsibility for these assets as well.⁵⁸ This becomes especially pertinent given the emergence of the Jin-class SSBN fleet, and the question this raises regarding whether the Navy or Rocket Force will assume or share operational responsibility for its SLBMs on board.

Reports on this question vary. The official *Global Times* newspaper, in a report dated 5 January 2016, cited a former Second Artillery Corps instructor who claimed that 'The most important function shift is that the new rocket force will be a commanding unit for land-, air- and sea-based

nuclear power, while the previous force was only responsible for land-based nuclear power.⁵⁹ A Chinese military website reported additional remarks by the same officer in an 8 January report, stating that it was a 'matter of time' before the Rocket Force assumed air and sea nuclear strike responsibilities. The instructor also suggested that the Army could assume control of short-range ballistic missiles from the Rocket Force, in order to enable the latter to focus on long-range nuclear and conventional strike missions.⁶⁰

However, *China Brief* affirmed on 10 January 2016 that there would be no reorganisation of individual Rocket Force units as part of the reforms, suggesting that the responsibilities of the service would remain confined for now to land-based nuclear and conventional ballistic missiles.⁶¹ This question of the potential future extension of Rocket Force responsibilities to airborne and seaborne nuclear forces remains unresolved at this time.

A second potential area of difference with the Second Artillery Corps is conventional missile strike autonomy. A recent Second Artillery Corps doctrine had outlined intentions of the branch to develop autonomous conventional missile attack capabilities, alongside its existing missile support to the other services.⁶² The creation of the Rocket Force as a fully independent service would suggest that these intentions are unlikely to have been revised.

India therefore faces a Chinese land-based nuclear force in 2018, featuring: a newly elevated official status; an ongoing programme of introducing a new generation of road-mobile and MIRV-capable nuclear missiles within the range of Indian targets; a dedicated testing programme simulating conditions similar to those that could be present in a Chinese attack against India; and a growing ambiguity in the conventional and nuclear missions of Rocket Force units, as conventional ballistic missiles continue to attain greater prominence in Chinese strategy.

The broader Chinese military reforms, alongside the specific formation of the Rocket Force, also have relevance for India–China nuclear stability. The overarching headline reform was the replacement of the seven Army military regions (with the northwest Lanzhou region and southwest Chengdu region closest and most relevant to India) with five new joint service 'theater commands'.⁶³ The PLA was previously divided into 18 group armies, each including around 30,000–65,000 personnel, across the seven military regions. Two group armies (the 21st and 47th) were stationed in the Lanzhou region, and another two (the 13th and 14th) were located in Chengdu.⁶⁴

As a retired Indian Army brigadier has noted, the formal division of China's ground forces nearest to India into the two separate Chengdu and Lanzhou organisational structures would complicate Chinese logistics and operations in a conflict with India.⁶⁵ A commentary published on a PLA website in February 2016 agreed with this point, observing that 'both Lanzhou and Chengdu MACs ("military area commands", or military regions) face India and Pakistan. If a war broke out in that direction, the two MACs would have to implement wartime organizational adjustment.'⁶⁶

This latter commentary also claimed that, in comparison to the more offensively-oriented Shenyang and Beijing military regions close to the Soviet Union/Russia, the India-facing regions had been more defensive in outlook and organised around holding ground in the event of an attack while reserves were mobilised from the Chinese interior. The new theater commands, however, bring with them a new operational approach that will be universally applied: 'In terms of strategic planning, the five Theater Commands is (sic) no longer positioned for regional defense, but head-on and proactive defense ... The new Theater Commands will attack proactively once a war broke out instead of passively waiting for defending the enemy at home.'⁶⁷

This thinking aligns with the official Chinese strategic concept of 'active defence', which was confirmed by a PLA website in March 2016 to have remained unchanged through the military reforms.⁶⁸ The concept emphasises a philosophy of not attacking unless attacked first, underpinning a strategically defensive general posture. However, in the event of an attack, forces within this posture must be quickly able to 'seize the initiative' at an operational level and conduct manoeuvres that are 'operationally offensive' (and thus potentially escalatory).⁶⁹

Some PLA writings have interpreted this concept as permitting pre-emptive attacks on an adversary if China is perceived to be facing substantial threat at the strategic level. For example, PLA experts at the Shijiazhuang Army Command Academy have argued that 'gaining mastery through counterattacks [i.e., striking only after being attacked] ... is not an effective way to seize initiative on the informatized battlefield'. One option that this study recommended was for the PLA to consider attacking first upon perceived adversary force mobilisations. A second option, once 'signs of enemy invasion are clear' (thus again, before any adversary attack has taken place) was for the PLA to be prepared to 'boldly conduct cross-border combat operations, directing the fighting to the enemy side and

inflicting heavy strikes on the enemy'. This differs from the first option in that it implies potentially attacking adversary areas and targets outside where adversary force mobilisation is taking place.⁷⁰

While not all PLA commentaries argue in favour of the above two specific options, a 2008 study of PLA thinking identified a common theme of seizing the initiative as early as possible, including rapid escalation at the very outset of a conflict, in order to quickly gain and retain the initiative and compel adversary submission.⁷¹ If the creation of theatre commands is intended to encourage capability development in favour of operations, to 'attack proactively once a war broke out instead of passively waiting for defending the enemy at home', as the PLA commentary explains the military reforms, such thinking may assume greater prominence in Chinese military planning and structuring.⁷²

Indeed, the focus of reforms relevant to India, thus far, has been to streamline structures to render them conducive to more rapid operations intended to seize the initiative early. The Lanzhou and Chengdu military regions have been replaced with a new 'Western' theatre command, headquartered in Chengdu, which significantly unifies oversight of Western border areas.⁷³ The overall Army headcount will be cut by 300,000, with a concurrent technological focus on mechanisation and 'informatization', defined as making full use of communications and geolocation capabilities alongside other current information technologies.⁷⁴ The reforms will produce a numerically smaller Chinese Army, but one which is more precise and fast-acting.

Logistical advancements prior to the military reorganisation were also intended to develop rapid Army mobilisation capabilities, including in areas close to India. These did not focus upon stationing new Chinese forces along the India border, but on improving transport links to the border from existing military bases in China's interior and alongside the border. Indian Defence Minister A. K. Antony assessed in 2011 that these efforts had included the construction of a 58,000 km road system and the development of five airfields.⁷⁵ The China Study Group policy body of the Indian government, estimating the effect of these advancements, has calculated that China can now transport over 10,000 troops to the Indian border in around three weeks; a task that would have taken up to eight times as long 10 years before.⁷⁶

In recent years, the PLA Air Force has also been bolstering its presence in areas close to India. These include establishing new airfields

in Tibet, with one estimate calculating that the new Western command contains nine airfields capable of supporting a conventional attack on India, and that this could potentially increase to 12 by 2025.⁷⁷ The IAF has been evaluated by an authoritative external assessment to hold the air advantage against China for now, primarily through the greater number (and thus redundancy) of IAF local airfields and poor Chinese bomber capabilities against Indian air defences. However, this balance may shift as Chinese Western command infrastructural developments continue to advance in the coming years, and if IAF modernisation continues to stall.⁷⁸

A more crucial challenge for India against China in the land domain is the Chinese military focus on conventional ballistic missile strikes to bridge several of the doctrinal and operational disadvantages it faces against India and other adversaries. Chinese views regarding the uses of conventional missiles represent perhaps the most aggressive strand of strategic thinking under the 'active defence' concept, and American experts have suggested that China is 'pursuing what is arguably the world's most missile-centric approach to warfare today'.⁷⁹

Conventional missile strikes are at the centrepiece of Chinese operational plans to seize the initiative at the earliest possible stage in the conflict, and quickly settle it on Chinese terms. Heavy conventional ballistic missile strikes are at the forefront of initial operations in PLA thinking, to both degrade adversary capabilities prior to perceived adversary offensive operations, and even potentially end the adversary campaign before it begins. A Chinese summary of the Second Artillery Corps campaign theory regarding conventional missile use has detailed targets of 'political and economic centers, important military bases, command centers, communication hubs, massive force groups, and rear-area targets in the enemy's strategic and campaign depth'.⁸⁰

China has compensated for its disadvantages in the land and air domains against India by bolstering its conventional missile forces.⁸¹ As well as conventionally-armed nuclear-capable missiles of the types held by the above Rocket Force missile bases near India, an IAF Group Captain has claimed that Chinese DF-11 short-range ballistic and DH-10 cruise missiles also have relevance in a potential conflict with India.⁸²

A recent study of Chinese strategic planning has highlighted the exploration of potential conflict scenarios by military analysts in 'high plateau frigid border regions', a description that, as the author observes,

could well characterise Tibet. These military commentaries have emphasised counter-deterrence operations in these scenarios, which 'include unmasking weapons and moving them in ways the enemy can observe, conducting nuclear weapons exercises, and conducting conventional ballistic missile strikes'.⁸³ Chinese interest in employing conventional missile attacks for nuclear signalling poses significant inadvertent escalation risks towards India, given that such strikes also remain prominent in China's conventional order of battle.

Given this possible Chinese dual employment of missile movements or attacks for both nuclear signalling and standoff conventional strike purposes, Chinese conventional missile attacks, or related preparations, could be interpreted by New Delhi as a nuclear threat, and compel responsive Indian nuclear and conventional missile mobilisations. Even solely conventional missile movements could be viewed by Chinese decisionmakers, according to their own perception of their potential nuclear significance, as representing an escalatory nuclear counter-threat.

Furthermore, a recent report indicates that the 47th Army Corps, headquartered in Lintong, Shaanxi province, will be specifically dissolved as part of the aforementioned military restructuring.⁸⁴ This will leave the remaining 76th (formerly 21st) Group Army, based in Chongqing, and 77th (formally 13th) Group Army, located in Baoji, as the major regional army concentrations, while there remain smaller divisions within the new Tibet and Xinjiang Military Districts, overseen directly by the Army rather than through the Western Theatre Command joint command structure.⁸⁵ The report quotes a Chinese defence source as stating that 'Two army corps in the Western military area is enough because China's most powerful missile troops in the Rocket Force are all stationed there.'⁸⁶

Indeed, Chinese use of conventional ballistic missiles, and even the prominence they are being assigned in Chinese military planning without being fired, elevates Indian strategic anxieties. Indian decisionmakers, facing the launch of any conventional ballistic missiles towards India, would be forced to consider the potential nuclear status of the incoming missiles, and if the missile attacks were intended as the first step of a wider Chinese invasion. The risk of misperception and responsive alert, and use of Indian conventional ballistic or nuclear forces would be high.

This dual-use nature of many of the Chinese conventional ballistic missiles, and the variety of potential missions that a Chinese missile strike may be part of, is further complicated by vagueness in Chinese

thinking as to what constitutes a nuclear attack. For example, some PLA commentary has suggested that a major conventional strike upon Chinese nuclear facilities could be viewed as nuclear first-use, and could legitimate a Chinese nuclear counter-attack without violating its no-first-use policy.⁸⁷ A further question concerns a scenario where India suffers a Chinese conventional missile or other strike upon a facility, such as potentially the IAF Ambala base, that could contain nuclear weapons or related materials. Should India consider such an attack as Chinese nuclear first-use, given that this is how China could view such an attack upon its own soil?

Indian strategists are currently grappling with these concerns. An expert at an Indian think-tank has warned that the PLA is 'capable of inundating the region around China's vicinity and beyond with hundreds, if not thousands of conventional and nuclear armed missiles'.⁸⁸ A former head of the Indian SFC and Strategy and Programme Staff, nuclear planning cell, has identified the above dual-use risks of nuclear misperception caused by Chinese conventional missile operational intentions, but has also commented on how these developments should inform Indian nuclear arsenal-sizing plans: 'China's superiority will create a strategic imbalance, and India will be forced to obtain matching or counter capabilities. The balance is not easily restorable unless India boosts the growth of the deterrent.'⁸⁹

Indian decisionmakers therefore face multiple and increasing pressures in the land and air domains from China. This section has identified these pressures as: a new generation of more accurate, road-mobile and MIRV-capable nuclear forces; a growing conventional ballistic missile strike capability that threatens inadvertent nuclear escalation; Chinese military thinking that prioritises conventional missile strikes upon adversaries, but that can potentially view a similar attack visited upon Chinese forces as nuclear first-use; reorganisation of Chinese conventional force structures to pose a more unified and precise threat against India; and logistical improvements near Indian border areas in order to mobilise Chinese troops more quickly, and to bolster the PLA Air Force presence.

INDIAN RESPONSES

These challenges inflame Indian worries about Chinese military intentions and capabilities, and are propelling Indian efforts to build its presence

in the land and air theatres relevant to China. They are also opening a discussion regarding the revision of India's nuclear doctrine. We will now explore these developments in Indian nuclear and conventional threat perceptions regarding China.

Chinese conventional forces in areas near India have been estimated to total around 400,000, although this will decline as the cut of 300,000 to the PLA Army is implemented.⁹⁰ By comparison, the total Indian forces under the Eastern Command facing China have been estimated to total over 300,000, although the bulk of these are reported to focus upon domestic counter-insurgency operations in the northeast.⁹¹ Indian Army formations in this category are divided into the 3rd Corps headquartered at Dimapur in Nagaland, the 4th Corps at Tezpur in Assam, and the 33rd Corps at Siliguri in West Bengal. The 14th Corps under the Northern Command, headquartered in Ladakh, could add another estimated 30,000 to this total.⁹²

The Indian Army Corps has been traditionally largely structured into 'strike' and 'holding/pivot' formats. The offensively-orientated 'strike' Corps are intended to penetrate adversary territory, and tend to include an armoured division and mechanised infantry. The 'holding/pivot' Corps also has limited offensive capabilities, but 'are largely designed to operate in a defensive role', and is not allocated 'armoured formations larger than brigades and the armoured regiments attached to the infantry regiments'.⁹³ Only three Army formations—the 1st, 2nd and 21st Corps, all directed against Pakistan—have historically been 'strike' Corps.⁹⁴ The entire above list of Corps relevant to China has been built as 'holding/pivot' Corps.

Indian defence planners have observed the Chinese military advancements detailed above and assessed their likely impacts on the ground force balance. Seeking to address the perceived risk of growing Indian disadvantage, the Army is raising new China-specific conventional forces. Two new divisions—the 56th and 71st Mountain Divisions—encompassing around 35,000 troops, are being raised in Arunachal Pradesh. The divisions will be equipped with artillery and T-90 tanks, normally used for penetrating assault.⁹⁵ A more ambitious plan is the creation of a Mountain Strike Corps, originally designed to possess a total manpower strength of around 90,000. This new 17th Corps would be the first China-specific strike Corps built to launch penetrating offensives into

Chinese territory; it includes two armour brigades, two infantry divisions and an artillery division.⁹⁶

However, progress in raising the 17th Corps has been hindered by insufficient funding. While the Indian government initially approved a sum of \$13.8 billion for the formation of the Corps in 2013, no new funds were actually provided to the armed services; they have been forced to locate resources for this from their existing budgets. The Army has been compelled to arm this new Corps from war wastage reserves crucial for the resupply of forces with equipment and fuel in the event of a conflict. This has contributed to the Army as a whole now only possessing enough war wastage reserves for 125 out of a total of 170 ammunition types to sustain three weeks of heavy fighting, violating a Ministry of Defence rule that sufficient stocks be held to last six weeks.⁹⁷ The Army is also under strength by 24,000 soldiers, and is severely lacking in 155 mm howitzers and attack helicopters, which are particularly crucial to establishing the 17th Corps.⁹⁸

The resultant difficulties have also forced Defence Minister Manohar Parrikar to reduce the planned strength of the Corps to 35,000 soldiers in April 2015, with a smaller budget of \$6.1 billion. It is uncertain whether even this reduced Corps will be ready by the targetted deadline of 2021–22, and a senior Army officer has predicted that it 'will be yet another immobile, inadequately equipped formation'.⁹⁹

Additional challenges are posed by the quality of infrastructure and IAF capabilities. In managing its border with China, India had previously permitted its border infrastructure to remain deliberately undeveloped, guided by the notion that poor roads would slow the pace of a major Chinese invasion, and buy time for Indian reinforcements to arrive. However, the resulting difficulty of organising Indian patrols and logistical support in these border areas, compared with the above substantive Chinese border infrastructure development programme, has compelled India to rethink. India has now launched a road-building programme in its border areas.

However, this infrastructure development is being hindered by continuing dysfunctions within the Indian defence policymaking system. The Indian government has allocated 61 new planned roads along the China border, totalling 3,410 km, to the Border Roads Organisation to be constructed. As of May 2015, only 19 of these roads had been completed. Slow progress in this area will limit the mobility of the 17th Corps.¹⁰⁰

The IAF upgraded three airfields at Along, Pashigat and Ziro in 2016, and is modernising its five other airfields in the state, located at Mechuka, Tawang, Tuting, Vijaynagar and Walong. This is part of a larger programme of airfield development in the northeast, with 35 sites in total targeted by the IAF for improvement programmes.¹⁰¹ However, IAF Vice Chief Air Marshal B. S. Dhanoa admitted in March 2016 that India could no longer sustain simultaneous Air Force operations against China and Pakistan due to their improving capabilities, the imminent retirement of the 10 IAF MiG-21 and MiG-27 squadrons in 2016–17, and the complex mechanisms of Indian defence procurement processes in addressing the shortfall.¹⁰²

Despite these difficulties, it is important to note the underlying Indian intention to field credible capabilities for striking into Chinese territory. Until the shortcomings in bolstering the general theatre Army and Air Force presence are addressed, this intention may compel a greater reliance on nuclear-capable platforms that form one of the few bright spots of force modernisation to help generate forward strike capabilities. Aside from the Agni nuclear missiles already outlined in Chapter 1, relevant platforms that are nuclear-capable or reportedly so include the Brahmos and Nirbhay missiles, as well as the Sukhoi Su-30 MKI, Jaguar and Mirage aircraft.

The Army is inducting at least five Brahmos Block-III regiments, each consisting of 36 missiles. Three of these regiments have already been inducted, with another two planned for induction.¹⁰³ This Block-III variant is designed with a 'steep-dive' capability that can reach targets on the rear side of a mountain, and at least one of the Block-III regiments will be stationed in Arunachal Pradesh.¹⁰⁴

Sukhois are being stationed at the Tezpur and Chabua airbases in Assam in the northeast, and at Bareilly in Uttar Pradesh, near the central border region with China.¹⁰⁵ While the prospective nuclear role of Sukhois is still unclear, these plans again underline Indian intentions to field potentially nuclear-capable platforms to strike into Tibet in a conflict with China.¹⁰⁶ The newly upgraded Pashigat airfield, which is located just 120 km from the Chinese border, can host Sukhois, Jaguars and Mirages.¹⁰⁷

Given the uncertain nuclear status of the Brahmos and Nirbhay missiles (the latter either independently launched or fired from a Sukhoi), their potential heavy use early in a conflict with China could further blur the line between conventional and nuclear operations as perceived by China. Indian Army intentions, as discussed in Chapter 1, to rely upon Prahaar strikes rather than the Air Force in the earliest stages of a conflict,

echoes the Chinese strategy of early missile barrages, with the actual nuclear or conventional role of the missile difficult to discern until the moment of impact. These plans further elevate the theatre risks of nuclear misperception, and thus, of inadvertent escalation.

The above Indian weaknesses in ensuring theatre conventional deterrence against China could create temptations to bolster general deterrence by shrouding the potential nuclear status of these Indian forward-deployed units in ambiguity. Without violating India's no-first-use policy, this would nevertheless pose an escalatory risk with grave implications to China, flowing from a Chinese conventional strike upon Indian nuclear platforms.

The deployment of further-reaching Indian strike platforms along the China border will bring a greater number of Chinese targets within reach. An Indian expectation, following current PLA thinking, that a China attack will involve an early blitzkrieg, including an overwhelming use of conventional ballistic missiles, will generate pressure on Indian military commanders to identify and destroy Chinese military concentrations and facilities in the earliest stages of a conflict.

Facing this pressure, distinguishing the potential nuclear missions that may be attached to some Chinese units may become a task of secondary importance. Indian conventional force commanders reportedly categorise all adversary stationary or mobile missile launchers as 'legitimate targets', regardless of their potential nuclear missions, and do not feel obliged to seek prior political authorisation to strike these targets.¹⁰⁸ An Indian attack on Chinese nuclear facilities or units, whether Indian forces originally intended to strike a specifically nuclear target or not, could prove dangerously escalatory. It could further cloud the position of both states on the conventional–nuclear threshold.

Indian capability development and nuclear doctrinal discussion includes a growing interest in pre-emption, as we have seen also occurring in Chinese discourse. This could have further implications for escalation control and management of the conventional nuclear threshold. An expert has pointed out the potential of the above 'legitimate target' policy to empower voices within the Indian defence establishment favouring a pre-emptive approach.¹⁰⁹ A former SFC chief has indeed called for the development of 'select conventional hardware that tracks and targets nuclear forces', arguing that this would 'provide the pre-emptive teeth to a deterrent relationship that leans so heavily on NFU [no-first-use]'.¹¹⁰

The officer later further developed this thinking, albeit with reference primarily to the Pakistan Nasr challenge, and now recommends 'building a specialised force that continuously tracks and marks all tactical nuclear missiles and incorporates an airborne conventional capability to neutralise them through preemptive action', prior to the launch of an Indian Army ground offensive.¹¹¹

The intention of both Indian and Chinese defence planners to strike as far as possible into adversary territory, including targetting potential nuclear facilities or nuclear-armed units, creates substantial challenges for determining adversary nuclear thresholds and managing escalation control. Escalatory pressures are likely to beset both India and China early in a conflict, as both sides seek early dominance through missile and air strikes and a fast-moving ground offensive. In this new context, where are the vertical limiting points that will mark mutually recognised firebreaks between small and major conventional conflict, or between conventional and nuclear conflict?¹¹² Indeed, a retired Indian Army officer has argued that the Army must

... build in suitable 'exit points' in the unfolding of its operation, such as prior to launch of pivot corps offensive resources, prior to launch of strike corps, prior to break out of enemy operational depth and prior to developing a threat to terminal objectives ... These would act as cues to maximising diplomatic pressures on the enemy leadership to concede legitimate and reasonable aims.¹¹³

The lack of strategic dialogue between India and China on these topics, combined with the poor record of border settlement talks, further hinders the possibility of either state gaining a clear picture of the limiting points of the adversary that would inform their operations planning. Also, given their ambiguity with regard to the nuclear threshold, substantial use of the above potentially nuclear-capable platforms can cloud the reading of the adversary regarding which escalation stage the conflict has entered.

DOCTRINAL TENSIONS

This blurring of conventional and nuclear platforms and missions, with negative consequences for understanding adversary nuclear thresholds,

forms one challenge emerging in India's nuclear thinking as concerned with the Chinese challenge in the land domain. This first capability-led challenge is joined by a second doctrinal concern: a debate within India's strategic community regarding potential nuclear doctrinal adjustments to meet the growing China threat.

The Indian nuclear doctrine formally remains one of no-first-use and massive retaliation in the event of a nuclear attack. However, the slow pace of Indian conventional force development along the LAC, as embodied by the early histories of the Mountain Strike Corps and border roads construction, coupled with a widespread perception that the conventional and nuclear disparity between China and India is only increasing, is generating pressure within India's strategic community to revise India's nuclear doctrine to compensate for these deterrence capability gaps.

While there is a full discussion of the Indian doctrinal debate in Chapters 4 and 5, China-specific doctrinal recommendations have been made. First, Indian experts question the validity of China's no-first-use policy for scenarios involving India. China's no-first-use formulation is silent on the use of nuclear weapons on its own territory, and Indian analysts suggest that this exemption could extend to Arunachal Pradesh and other areas claimed by China as its own territory. A 1995 formulation of China's no-first-use pledge also applied the policy only to NPT member states or members of nuclear-weapon-free zones, when India belongs to neither category.¹¹⁴ Such doubts regarding the applicability of China's no-first-use pledge vis-à-vis India also fuel calls for reviewing India's no-first-use policy.¹¹⁵

Second, the perceived growing difficulty of maintaining credible conventional deterrence against China has led to Indian suggestions regarding doctrinal adjustment tailored to this challenge. A retired Indian SFC chief and head of the Strategy Programme Staff, nuclear planning cell, has noted that while the no-first-use commitments of both India and China formally rule out nuclear war between them, 'nuclear coercion as a possibility remains high'. He also raises the possibility that either state may dispense with no-first-use under extreme pressure in a bilateral conventional conflict: 'In severe conditions during war, the option of nuclear use may be the only one to seek victory rather than accept defeat, notwithstanding the consequences.'¹¹⁶

A retired Army officer, Col. Ali Ahmed, has argued that in the event of a perceived looming major Chinese conventional offensive against India—

but before such an offensive has actually begun—Indian decisionmakers could publicly verbally repeal the no-first-use policy to warn and deter China. The scenario envisioned for such an adjustment would be Chinese offensive preparations in the Siliguri passage and around Arunachal Pradesh. Ahmed argues that this would have the effect of establishing the clear, mutually recognised natural limiting point in an India–China conflict that is presently lacking: ‘Retracting from NFU itself would be a significant move to indicate that thresholds are being crossed in a conventional war.’¹¹⁷

The effect of new Chinese and Indian nuclear and conventional capabilities, and the continuing dissatisfaction within the Indian strategic community regarding the perceived effectiveness of its general deterrence against China, is therefore substantially clouding bilateral perceptions of nuclear thresholds. As we have seen, they are also placing pressure on the no-first-use policies of India and China.

These developments threaten India’s ability to establish clear intra-conventional and conventional nuclear escalation thresholds in the event of a conflict with China. The use of potentially dual-use platforms can erode the distinction between conventional and nuclear conflict, more so if they are deployed to eradicate Chinese nuclear units, significant conventional force concentrations and command centres. This becomes especially salient, given India’s intentions to field Brahmos-II (K) missiles, specifically intended to destroy these latter targets. Calls to revise India’s no-first-use doctrine immediately in the face of China’s perceived growing military superiority, or to hold this option as a card to be played during a conflict, further highlight temptations within the Indian strategic discourse to employ nuclear weapons, even if only for signalling purposes, to solve a challenge better addressed by building strong conventional defences.

IMPLICATIONS FOR NUCLEAR INTERACTIONS WITH INDIA: THE NAVAL DOMAIN

A similarly rapidly-changing domain of Sino-Indian strategic competition is in the naval sphere. China has held a long-standing technical and political interest in fielding a nuclear-armed submarine fleet. A recent analysis of Chinese naval discourse found a recurring perception of

developing a nuclear-armed submarine fleet as essential to general naval projection, and a core long-term objective of the PLA Navy.¹¹⁸ Despite this political commitment, however, a viable SSBN fleet is only emerging today. China has only possessed a solitary Xia-class submarine since the late 1980s, which is not viewed by analysts and foreign government reports as a core element of the Chinese nuclear posture. However, a new fleet of Jin-class SSBNs is presently entering service. Up to five Jin-class boats are planned.¹¹⁹ Therefore, the PLA Navy dream of an SSBN fleet as the symbolic flagship of credible Chinese maritime projection is finally coming to fruition.

Beijing's previous justifications of its growing naval projection in terms of a narrative of limited Indian Ocean anti-piracy missions are being complemented by a greater emphasis on the need to guarantee Chinese access to sea lines of communication (SLOCs). This new narrative is paving the way for a more expansive and permanent Chinese Indian Ocean presence.

The perceived vulnerability of China to blockade, and the necessity for sufficient SLOC force protection, animates recent Chinese maritime discourse.¹²⁰ The 2015 Chinese defence white paper specified that 'the PLA Navy will gradually shift its focus from "offshore waters defense" to the combination of "offshore waters defense" with "open seas protection"'.¹²¹ The director of the PLA Naval Research Institute has estimated that four-fifths of the total value of Chinese foreign commerce is transported by sea, and another Chinese expert calculates that over a third of Chinese oil imports must travel through the Strait of Hormuz alone, concluding that 'To sustain development, China needs secure sea-lanes and unfettered freedom of navigation'.¹²²

The linkage of Chinese nuclear-armed submarines to a broader mission of growing maritime projection in Chinese strategic thought is also reflected in conventional naval developments. The US Department of Defense observed in 2015 that China now fielded the largest naval force by number of vessels in Asia. Chinese submarines have also docked in Colombo and Gwadar; the US Department of Defense commented that these types of forays were likely 'area familiarization' missions, designed to support and regularise further visits and patrols to expand Chinese naval reach.¹²³

The Andaman and Nicobar islands, the site of an Indian tri-service command in the Indian Ocean, is seemingly a particular area of interest

for these Chinese operations. Chinese submarines are reportedly identified around the 'Ten Degree Channel', a 150 km-wide passage separating the Andaman from the Nicobar islands, an average of four times every 12 weeks.¹²⁴ The true volume of submarine traffic may be higher; in one encounter reported in February 2016, the Indian Navy could only locate a Chinese submarine support boat and was unable to determine whether this was accompanied by submarines.¹²⁵

These developments have an impact on Indian security discourse that echoes the fear of naval blockade with which Indian maritime expansion is greeted in Pakistan discourse. Maps are regularly printed in Indian newspapers, documenting recent Chinese port visits and port development projects surrounding India, alongside technical details regarding the Chinese ships involved. The 'string of pearls' concept, first pioneered by an American defence contracting firm, has become a principal frame by which Indian analysts view Chinese maritime nuclear and conventional projection.¹²⁶ The 'string of pearls' refers to the potential for China to create a virtual chain of patrolling naval forces that straddle friendly foreign bases and ports surrounding India. Such a policy would prevent India's Navy from travelling far beyond its littoral.

The reality of such Chinese intentions is disputed; analysts have remarked on the sheer logistical difficulty of managing an array of foreign bases and their accordant diplomatic relations as reason enough to doubt such a plan could ever be implemented. However, China is nevertheless exploring options for establishing a network of facilities, or 'places', in the Indian Ocean, to permit permanent access for refuelling and replenishment without being a formally declared Chinese military base. The first node in this network could perhaps be the Djibouti Chinese naval 'logistical facility', announced in February 2016.¹²⁷ Djibouti's foreign minister has estimated that thousands of Chinese military and civilian staff will man this base.¹²⁸ The Indian concern is that future nodes will be set up in locations surrounding India, like Gwadar, Colombo and the Coco Islands in the Indian Ocean.¹²⁹

This fear of Chinese nuclear and naval projection has an effect on Indian perceptions of the role of the Arihant. While India's nuclear doctrine refers to the triad of land, air and sea-launched nuclear forces as fulfilling a second-strike posture guided by a no-first-use policy, Indian naval and nuclear discourse has a frequent tendency to suggest that the Arihant can serve an additional role, that is, to deter general Chinese

naval projection. This is despite the fact that the Arihant will likely only initially patrol around Indian littorals due to its technological novelty; as mentioned above, it is technically designed and politically intended to serve only as a last-resort deterrent, and is not suited to be the spear of a blockade-breaking Indian conventional naval offensive.¹³⁰

A further challenge, linked to a core theme of this book, is the rising risk of nuclear misperception in this context.¹³¹ The growing naval projection of India and China, especially in the form of potentially nuclear-armed ships and submarines, threatens to combine threats emerging from their regional competition for Indian Ocean access with tensions arising from their nuclear force growth and diversification. Along with the dedicated SSBN fleets outlined above, Chinese naval force modernisation includes a new generation of potentially dual-use platforms, such as the Chinese Type-041 attack submarine discussed in Chapter 2. Determining the class and potential nuclear mission of these vessels will be difficult, and even more so given that they will operate with conventional escorts.

This context generates multiple potential scenarios for the inadvertent introduction of a nuclear dimension into conventional naval tensions. One situation could be an attempted denial of access to an enemy boat that is wrongly identified as possessing a solely conventional mission. Alternatively, and as discussed earlier in the land theatre section, both states may have an incentive to create the incorrect impression that far-reaching vessels have a nuclear mission, so as to deter adversary efforts to deny access.

Despite this context, there is very little institutionalised naval dialogue between India and China to reduce misperceptions about the other's intentions and discuss mechanisms to resolve a maritime standoff. India has established the Indian Ocean Naval Symposium (IONS), a wide-ranging forum of 35 full-member states, to discuss Indian Ocean maritime security. However, its membership only includes China as an observer.¹³² For its own part, China is planning a 'One Belt One Road' (OBOR) inter-state partnership and logistics chain of land and sea routes stretching to Europe.¹³³ As of now, India has refused to join discussions on this project. The near-absence of dialogue regarding maritime intentions will further complicate naval nuclear planning, as both states operate without a clear picture of the boundaries of naval nuclear projection and escalation triggers of the other.

This exploration of Sino-Indian competition in the maritime domain has therefore highlighted the same growing risk of nuclear misperception as in the land theatre, based upon misidentification of adversary nuclear thresholds; platform missions; and ultimate nuclear intentions.

CHALLENGES POSED BY CHINA–PAKISTAN COOPERATION

A final element of China's strategic policy that has greatly impacted Indian security has been its long-standing support to Pakistan in developing its nuclear and defence infrastructure. China has transmitted warhead designs and missile technology to Pakistan in the past, and their nuclear cooperation is entering a new stage. As discussed in the Pakistan section, China is assisting Pakistan in its naval nuclear ambitions, and is involved in at least six nuclear reactor projects in Pakistan. Its effort to assist Pakistan in maintaining a degree of strategic nuclear parity with India also extends to endorsing Pakistan's prospective membership of the NSG, the forum of states that sets nuclear technology export rules.¹³⁴

The China–Pakistan Economic Corridor (CPEC) plan, announced in 2015, also threatens to complicate India's strategic environment. The plan represents multiple projects under the overarching OBOR initiative, intended to develop Pakistan's energy, general logistics and transport infrastructure, including the strategic Gwadar port, while also easing Chinese access to Central Asia and beyond in the process.¹³⁵ The Pakistan government has estimated the total cost of the projects at \$46 billion.¹³⁶ A recent analysis by a Pakistani financial trading and research firm, factoring in the investments and interest, has concluded that the country may have to repay a total sum of \$90 billion to China.¹³⁷

Specific projects include the expansion of major Pakistan railway stations, including those in Bahawalpur, Karachi, Okara, Peshawar, Quetta and Rawalpindi. Major motorways, such as the Multan–Sukkur highway running between Lahore and Karachi, will also be redeveloped.¹³⁸ A new motorway between Quetta and Gwadar was inaugurated by the Prime Minister and Pakistan Army chief in February 2016.¹³⁹ An Indian analyst has suggested that these improvements will enhance the ability of the Pakistan military to mobilise ground forces.¹⁴⁰

Planned CPEC project sites also encompass territory in Kashmir that is claimed by India, and thus represent not only a Chinese rejection of

these Indian claims, but also intentions to actively develop the presence of China and Pakistan in these areas.¹⁴¹ Indian intelligence agencies reportedly briefed the government in March 2016 of a forthcoming assignment of Chinese troops to Pakistan, ostensibly under CPEC project security roles. PLA troops have reportedly been repeatedly identified in Pakistan-governed Kashmir since 2015, close to the LoC with India.¹⁴² This growing direct Chinese troop presence, if the reports are accurate, would complement Pakistan's separate plans to raise 10,000 new troops for CPEC project security missions.¹⁴³ Even if the Chinese forces involved are minimal, they are symbolically placed at the forefront of a likely conflict area between Pakistan and India, threatening India with China's involvement as a party to this conflict at the very outset. Indian Prime Minister Modi reportedly robustly criticised CPEC as 'not acceptable' while meeting Xi Jinping in May 2015.¹⁴⁴

This expansive new stage of Chinese support for Pakistan's nuclear programme therefore combines an ambitious plan to bolster Pakistan infrastructure, with many projects potentially relevant to supporting military mobilisation. The linkage of the nuclear and conventional planning of Beijing and Islamabad illustrates the complexity of the Pakistan–India–China nuclear triad. These developments underline the importance of institutionalising nuclear dialogue among the three states to clarify nuclear intentions, and thereby reduce the risk of conflicts arising from misperception.

CONCLUSION

This chapter has surveyed Chinese nuclear thought; nuclear-conventional force advancements in the maritime and land theatres; and military cooperation with Pakistan. The Chinese land-based nuclear threat currently posed to India involves an increasingly precise, mobile and MIRV-capable nuclear missile force; a testing programme simulating environmental conditions similar to those in India-facing nuclear base locations; a new prioritisation being given to nuclear forces in military reforms; and growing ambiguity in conventional or nuclear missions of Rocket Force units, as conventional ballistic missiles continue to obtain greater prominence in Chinese strategy. Many of these same challenges—of greater precision, rising prominence of dual-use capabilities, and ambiguity

of nuclear intentions—recur in the naval domain. To this latter theatre can also be added the significant complication of the entry of nuclear naval competition into the tense Indian Ocean conventional naval rivalry, with a lack of clarity regarding the exact intended patrol routes and maritime boundaries to be defended. Finally, a new level of Chinese nuclear and infrastructural cooperation with Pakistan threatens to further heighten Indian nuclear and general threat perceptions.

This changing context generates several issues conducive to inadvertent escalation. Out of the above issues surveyed, inadvertent escalation could be particularly delivered by a misinterpretation of Chinese intentions in specific Chinese ballistic missile, Air Force or Ground Force movements as part of establishing the Western command or even related to CPEC project protection in Pakistan; heightened nuclear threat perceptions generated by a continued Chinese high level of seemingly India-relevant missile testing; increased general threat perceptions produced by continued aggressive Chinese submarine 'area familiarization' patrols close to Indian littorals, including potential Chinese nuclear-capable vessels; and with this, the danger of conventional interdiction of a nuclear-armed vessel or its conventional escorts.

Indeed, alongside the issues identified in the chapter, China has a broader record of military activities, conducted without political decisionmaker knowledge, that have elevated adversary threat perceptions. The 2007 Chinese anti-satellite kinetic test, which generated significant strategic alarm in New Delhi and Washington, was concluded by the Pentagon to have been scheduled and conducted without the prior knowledge of political leaders (although the overall Anti-satellite weapons [ASATs] technology development programme had been likely politically authorised).¹⁴⁵ Chinese harassment of the US Impeccable surveillance vessel in 2009, compelling the US to send a guided missile destroyer to reinforce the boat and issue a public diplomatic protest, was also judged by the Pentagon to have occurred without the awareness of Chinese civilian leaders.¹⁴⁶

The Chinese military provocatively unveiled its J-20 stealth fighter, again without informing Chinese political leaders, during a visit of the US Defence Secretary, Robert Gates, to Beijing, and immediately prior to a Chinese state visit to Washington; Gates remarked that by this action, 'the PLA nearly wrecked both trips'.¹⁴⁷ Poor Chinese civil-military coordination has in fact been generally identified in a recent major study

as a substantial concern in Chinese defence policymaking.¹⁴⁸ Inadvertent escalation therefore remains a real regional danger with regard to Chinese nuclear-conventional defence approaches.

This regional context also creates risks of accidental escalation. Politically ordered, conventional missile strikes upon nuclear or nuclear-capable units may not be deliberately designed to introduce nuclear dimensions to a conflict. However, the effects of such attacks could nevertheless be perceived as such by the adversary. In addition, authorised substantial Chinese conventional ballistic missile strikes upon Indian territory or troops, or aggressive general attacks by Chinese conventional forces, may compel an intra-crisis political review of India's no-first-use commitment; a scenario that has been suggested by the former head of India's nuclear planning cell, among other Indian experts. The risks of both inadvertent and accidental escalation are further elevated by the absence of substantive nuclear and general defence dialogue.

The recurring themes in this chapter, as throughout this book, have been the growing ambiguity in nuclear thresholds arising from new debates on nuclear doctrine; the fielding of a new generation of nuclear forces; the multiple technical posturing and doctrinal options presented by new, potentially dual-use ballistic missiles, naval and air platforms; the opportunities for misperception of ultimate nuclear intentions by adversaries, and the risk of inadvertent nuclear escalation, within this context. These issues highlight the importance of convening regular nuclear dialogues among all three states to discuss and clarify their nuclear and naval intentions. This would particularly support nuclear risk reduction efforts in preventing the risk of misperception of a conventional for a nuclear mission or vice versa, as one of the core emerging challenges in both the land and sea domains. As the nuclear forces of all three may come into increasing direct contact through the prospect of naval nuclear-armed fleets, institutionalising the practice of trilateral nuclear dialogue can prove a worthy endeavour to prevent a nuclear crisis or reduce tensions if they occur.

There are, admittedly, strategic advantages that could be gained by all three states in creating a certain ambiguity regarding nuclear thresholds. Efforts discussed in this chapter have included: the growing reliance of both India and China on potential dual-use conventional missiles; the reported intentions of Indian and Chinese military staff to target possibly nuclear-capable adversary facilities and platforms in the early stages of a

conflict; and suggestions aired in strategic discourse that the no-first-use commitments of India and China may be more conditional than appears at first sight. Indian strategists have proposed this conditioning of no-first-use with reference to a conventional Chinese force build-up in areas close to India; and Chinese strategists have discussed a similar flexibility in terms of a conventional attack on Chinese nuclear facilities.

A decision by China and India to formally lower their nuclear thresholds, as Pakistan is doing through its new 'full spectrum deterrence' concept, may appear attractive in terms of bolstering general deterrence against a fast-changing threat environment. If this lowering is not performed through the formal declaration of a new doctrinal concept, more subtle shifts could push the threshold in the same direction. This latter method could be executed by quietly introducing potentially nuclear implications into conventional operations, such as: mixing conventional and nuclear missile forces at the same bases; continuing reliance on conventional ballistic missiles, which are difficult to identify upon launch as nuclear or conventional until the moment of impact, in offensive planning; assigning dual-use naval platforms to far-reaching 'area familiarisation' missions in sensitive areas for the adversary; and for influential strategists to continue discussing nuclear warfare, even if only in the form of intra-conflict nuclear doctrinal revision, as a relevant option in resolving conventional force dilemmas.

However, deliberately increasing the opportunity and risk of nuclear misperceptions in this manner will do little to improve the national security of these states. New nuclear and naval dialogues, combined with a dedicated effort to separate rather than blend the conventional and the nuclear domains in force planning and strategic thought, will better stabilise regional security.

To fully integrate the above Chinese nuclear and conventional doctrine and force developments into Indian strategic planning, a public Indian official defence review should be conducted. This review should assess these challenges and lead to the adoption of a posturing response that clearly separates conventional from nuclear threats, and assigns response packages to conventional and nuclear forces, respectively. Along with disaggregating and prioritising the specific threats that China poses to Indian security, and generating a more efficient use and development of defence resources in response, such a process would reduce the ambiguity, as we have seen emerging above.

Having completed our analysis of the strategic threats posed by Pakistan and China, the next chapter will explore India's nuclear doctrinal evolution and outlook in more detail, including the perceived relevance of these threats in shaping India's current and future doctrinal approaches.

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The Doctrinal Background

Nuclear Deterrence in Indian Strategic Thought, 1964–2003

In the first three chapters, we explored India's nuclear force development and its growing nuclear equation with Pakistan and China. What has been the impact of India's growing nuclear profile and emerging nuclear threats on its nuclear doctrine? This chapter and the next examine the evolution of the ideational aspect of India's nuclear weapons policy: its nuclear doctrine. This chapter traces the evolution of India's nuclear doctrine after the 1998 nuclear weapons tests, till the declaration of the official doctrine in 2003. Between the nuclear tests of May 1998 and the declaration of the official doctrine in January 2003, India's nuclear doctrine saw both continuities and changes. However, to fully understand the fundamentals of India's nuclear thinking, a historical background is necessary. The available literature has ignored how India's historical experiences shaped its nuclear ideology. Therefore, the discussion on India's nuclear doctrine starts from 1964, when China tested its first nuclear device and India began ruminating over a nuclear capability.

This chapter explicates this evolution through New Delhi's doctrinal journey. Chapter 5 reflects on India's doctrinal journey from January 2003—when India proclaimed its official nuclear doctrine—till the current era. It underlines various internal and external factors which have generated questions regarding the existing nuclear doctrine and also influence the current debate. Two specific attributes of the nuclear doctrine—no-first-use and 'massive retaliation'—which have attracted particular attention, will be discussed in detail. The chapter will conclude with an exploration of contemporary pressures, both inside and outside government, that presently affect the Indian doctrinal debate.

As these two chapters will demonstrate, Indian strategic thought on the question of how India should exercise nuclear deterrence has

traditionally been characterised by strong support for the concept of 'minimum deterrence'. This was the dominant view of nuclear deterrence prior to India's nuclear tests in 1998, and was further reflected in the 1999 DND. However, since the release of the 1999 doctrine, there has been increasing pressure within and outside the government to emphasise the 'credibility' part in India's doctrinal statements and nuclear force posture developments. These pressures emanate from a perceived worsening state of rivalry with Pakistan and China, and the growing capabilities of India's technical nuclear force. An official defence review is required to establish how India intends to balance these competing imperatives: that is, to demonstrate the 'credible' and 'minimum' nature of its nuclear doctrine and forces within the strategic environment it faces currently and in the future.

DOCTRINAL THINKING BEFORE THE MAY 1998 TESTS

The Chinese nuclear tests of 1964 had the singular contribution of forcing the strategic thought of nuclear weapons and nuclear deterrence upon India's decisionmakers. Before the Chinese tests, nuclear weapons were largely observed through the lens of nuclear disarmament. China's possession of nuclear weapons brought to India's doorstep the core question of the nuclear age: How does one confront the reality of the bomb and its implications on Indian national security?

Even before China had tested its nuclear weapons, Prime Minister Jawaharlal Nehru had been able to understand that at the least, Chinese possession of nuclear weapons would have a 'psychological impact' on India's concerns regarding its national security.¹ Soon after China went nuclear, Indian decisionmakers had to confront the inescapable insecurity vis-à-vis the Chinese nuclear arsenal, and also the key question: Should India develop a nuclear deterrent of its own? This fundamental question gripped India during the later part of the 1960s.

In response to China's nuclear threat, India first sought guarantees of extended nuclear deterrence from the major nuclear powers of the world—the US, Soviet Union, and the United Kingdom (UK).² Even when India was morally against the use and existence of nuclear weapons, its own security needs merited seeking a form of nuclear deterrence. When it became apparent that India could not receive any solid security guarantees, largely because it wanted to avoid any treaty alliances with other

major powers and maintain its non-aligned status, the decisionmakers nevertheless felt comfortable in the perception that, 'in case (of China attacking India), the USA and USSR could not stand by and watch. The danger to both these powers from a nuclear China which has subjugated India could be tremendous for them to face.'³

As China's nuclear capabilities grew with subsequent tests in the 1960s and with the development of delivery vehicles, the clamour for Indian security increased likewise in Parliament and also in the press. In April 1970, as China tested both a thermonuclear weapon and launched its first satellite into orbit, indicating its ICBM capability, a vigorous domestic debate gripped India. This was conducted mostly within the Indian Parliament, with many members both in the ruling Congress party and in the opposition questioning the government on its policy responses to the Chinese nuclear tests.⁴

Against this background, the DAE prepared a secret memo for the Prime Minister in April 1970.⁵ The memo was seen and approved by P. N. Haksar (Indira Gandhi's Principal Secretary), Vikram Sarabhai (Chairman, Atomic Energy Commission) and Raja Ramanna (who played an important role in the 1974 nuclear explosion and later became Chairman, Atomic Energy Commission). This notable document underlined some of the earliest thinking by Indian decisionmakers on doctrinal issues concerning nuclear weapons. The question that the DAE seemed to be dwelling on was that of Chinese conventional superiority in a confrontation with India on the contested Himalayan border. Some noted parliamentarians had asked the government to develop tactical nukes in order to deter China. As the DAE memo argued, 'There is today an opinion held by several military commentators and some members of parliament that tactical nuclear weapons would prove of very great advantage if our ground troops are attacked by China.'⁶

For the drafters of the memo, however, this argument was highly fallacious. From their perspective, there was nothing seemingly distinguishable between the tactical and strategic use of nuclear weapons, as 'every time a tactical exchange takes place, it invariably escalates to a strategic exchange as soon as one of the parties starts having the worst of the tactical exchange.' If this was the case, then acquiring TNWs would not have sufficed; as the DAE memo indeed argued, what India required was a strategic nuclear deterrent. This strategic capability, according to the memo, should be able to 'inflict unacceptable damage on a second

strike'.⁷ Since such an effort would require enormous resources, which India could not spare at that time, the memo concluded that the 'challenge of China is most satisfactorily met by making India economically and industrially strong'.⁸

Notwithstanding the recommendations of the memo, the document is relevant for understanding the early impulses in India's doctrinal thinking. Two doctrinal precepts stand out. The first is that India would eschew nuclear warfighting involving TNWs. The second is that India's doctrinal impulse appears to be inspired by the logic of 'deterrence via punishment': for deterrence to exist, any use of nuclear weapons against India should have been met with an 'unacceptable damage through second strike'.⁹ As we will see later, these precepts remained the fundamental guiding principles of India's doctrinal evolution during the period when it actually began moving towards acquiring a weapons capability.

In the 1970s, thanks to India's treaty of friendship with the Soviet Union, its resounding military victory over Pakistan in the 1971 War, and the overall benign strategic environment in its neighbourhood, the issue of Indian nuclear weapons remained on the backburner. India did conduct a Peaceful Nuclear Explosion (PNE) in 1974; however, as new archival research has shown, the PNE was devoid of any military capability.¹⁰ Serious considerations regarding a nuclear weapons capability only started manifesting themselves during the late 1970s, when intelligence sources confirmed Pakistan's successful development of uranium enrichment technology.¹¹ The existence of a Pakistani covert nuclear weapons programme was first pontificated by the JIC report called JIC Paper No. 4/79 of 12 July 1979.¹² As K. Subrahmanyam has argued, it was the first time that India perceived a nuclear threat from Pakistan.¹³

By 1981, the Indian Ministry of External Affairs was convinced that 'Pakistan has set off on a race to go militarily nuclear'.¹⁴ China's generous aid to Pakistan's strategic programme equally unnerved New Delhi. The Chinese collusion was also disconcerting for India. As a secret assessment by the MEA argued: 'The Chinese connection to Pakistani programme was less in the realm of speculation than in the realm of reality.' It also stated that Pakistan may conduct its first nuclear explosion at Lop Nor, as 'it would appear to be just one more nuclear test by PRC' and help her avoid 'the range instrumentation problems'.¹⁵ For India, rapid advances made by Pakistan in its nuclear weapons programme and Chinese collusion had brought the nuclear threat home. If Pakistan was going down the

nuclear path with Chinese assistance, the possibility of US arms sales to Pakistan, including F-16 fighter jets, was viewed in New Delhi as a 'serious aggravation in its security environment'.¹⁶

The response from the Indian side was twofold. At one level, Prime Minister Indira Gandhi considered pre-emptive strikes on Pakistan's nuclear infrastructure. As a top secret Central Intelligence Agency (CIA) report in September 1981 estimated, 'Conditions may be ripe for a decision by Prime Minister Indira Gandhi to instigate a military confrontation with Pakistan, primarily to provide a framework for destroying Pakistan's nuclear facilities'.¹⁷ Similar assessments of Indian intentions were offered by the Soviets.¹⁸ On the other level, India veered towards nuclear testing.¹⁹ The fear of economic sanctions, however, dissuaded Prime Minister Gandhi.²⁰ Even when both strategies came to naught, this strategic context paved the way for the weaponisation of India's nuclear capability. By the early 1980s, DRDO had started experimenting with Jaguar Deep Penetration Strike Aircrafts for the toss-bombing of nuclear weapons.²¹ If aircraft provided one vector for nuclear delivery, the development of ballistic missiles under the IGMDP of 1984 provided the other.²² By the early 1980s, India had therefore embarked on the process of weaponising its nuclear deterrent. Soon after, it would also start cogitating over its nuclear doctrine and posture.

The formation of a committee led by Gen. K. Sundarji in 1985 was the first serious effort by the government to identify requirements for establishing Indian nuclear deterrence against China and Pakistan.²³ By the early 1980s, Sundarji had already ruminated over the problems of nuclear deterrence in the Indian context in some of his writings. In his papers published in the *Combat College Journal of the Army School of Combat*, he had suggested some of the requirements of an Indian nuclear deterrent, which veered around the idea of a minimum deterrent.²⁴ Likewise, the Sundarji Committee, in its recommendations to Prime Minister Rajiv Gandhi, argued for a minimum deterrent capability, entailing a force structure of 60–130 nuclear warheads, primarily mounted on aircraft. The committee operated on the assumption that India would require a second strike capability against China, as establishing this posture against India's northern neighbour would also automatically generate sufficient deterrent capability against Pakistan. As one of the committee members argued, this was the first time the term 'minimum deterrence' was used in the Indian context by any government-approved study on nuclear

deterrence.²⁵ The committee believed that India's nuclear posture had to be retaliatory in nature; neither first-use nor tactical use of nuclear weapons was deliberated upon.

The idea of 'minimum deterrence' and no-first-use remained with Indian policymakers and analysts thereafter. After the Brasstacks crisis of 1986–87, the Rajiv Gandhi government cogitated over a series of Nuclear Confidence Building Measures (CBMs) with Pakistan. One of the recommendations given by experts such as K. Subrahmanyam and Raja Ramanna was to propose a no-first-use agreement to Pakistan. This was again indicative of India's early nuclear thinking.²⁶ However, Prime Minister Rajiv Gandhi considered it politically impossible. As K. Subrahmanyam reminisces, since Rajiv Gandhi had 'talked so much about the Pakistani nuclear effort up and down the country, the offer of no-first-use at that stage would look like India backing down under the Pakistani threat'.²⁷ This idea remained embedded within the Indian security and foreign policy establishment. When, in the early 1990s, the US pressurised India to seek more nuclear confidence-building measures with Pakistan, these ideas were rekindled by the foreign office. The Indian government not only offered an extension of the non-attack agreements to major centres of populations and economic facilities, but also for the first time, at an official level, offered Pakistan a no-first-use agreement. Both of these were, however, rejected by Pakistan.²⁸ Notwithstanding the results of such enquiries, these events underlined India's basic nuclear philosophy of no-first-use and averseness to nuclear warfighting. Countless articles written by strategic experts like K. Sundarji, K. Subrahmanyam and Air Commodore Jasjit Singh in the 1990s continued to advocate a minimum deterrent strategy if ever India crossed the 'nuclear rubicon' to develop an overt nuclear force.²⁹

Indian nuclear thought, especially during the formative years of India's nuclear weaponisation in the 1980s and 1990s, in many respects laid the roadmap for India's likely nuclear strategy. As India's former Foreign Secretary and NSA Shivshankar Menon argues, this 'preparatory thinking' was of immense consequence in formulating India's nuclear doctrine after the 1998 nuclear tests.³⁰ The events of May 1998 would bring immense domestic and international pressure upon India to immediately announce its nuclear doctrine. Many of the strategic thinkers, especially Jasjit Singh and K. Subrahmanyam, who had already advocated a policy of 'minimum deterrence', were at the helm of preparing this post-1998 declaratory

Indian nuclear strategy. Their presence on the NSAB preparing the nuclear doctrine partly ensured that India would follow a similar approach to that recommended by official studies and their own writings prior to the 1998 tests.³¹

However, preparing and announcing an Indian nuclear strategy, even with this pre-existing base of doctrinal analysis and thought, was not an easy task. As the next section will underline, the government required considerable time to develop an official nuclear doctrine. Given the pre-existing focus on 'minimum deterrence', however, this particular form of doctrinal approach and posture looked the most likely choice in the immediate aftermath of the 1998 tests.

AFTER THE TESTS, BEFORE THE DOCTRINE: 1998-99

As the dust settled in the desert of Pokhran after the nuclear tests on 11 and 13 May 1998, it also finally laid to rest one of the most highly debated and controversial subjects in India's history: its nuclear weapons status. The ambiguous status in the previous years gave way to India being a self-declared nuclear weapons state. Yet, this new status brought to the fore the doctrinal issue: How would India now use its newly demonstrated nuclear weapons capability? Achieving material capability was only the first step towards nuclear deterrence; effecting it on the ground required a clear articulation of intentions on the use of nuclear weapons and how they would be operationalised in practice. A nuclear doctrine was therefore a necessary requirement. The nuclear doctrine was also important for a diplomatic reason. Soon after the nuclear tests, New Delhi had initiated a nuclear dialogue with the US.³² If the Indian objective was to convince Washington, D.C. to lift economic sanctions and accommodate her in the nuclear order, the Americans were keen to put a plug on India's strategic capability by convincing New Delhi to sign the CTBT, negotiate the FMCT and cap its missile capabilities.³³ Washington, D.C. was equally keen on New Delhi formulating a nuclear doctrine which could provide a sense of India's nuclear ambitions. Both strategically and diplomatically, therefore, there was an immediate requirement for articulation; however, New Delhi adopted a graduated response.

The first articulation of India's nuclear doctrine came in the form of a series of statements, spread across 1998, by its political leadership.

Just two days after the second round of tests on 13 May, Prime Minister Vajpayee shared his thoughts on some of the ideas that would guide India's nuclear doctrine in an interview with *India Today*. It was clear to the Prime Minister that the tests had catapulted India into the ranks of the few states in possession of nuclear weapons; unlike 1974, now there was no rationale to shroud India's nuclear status in 'needless ambiguity'. However, India's weapons would never be 'weapons of aggression'.³⁴ This was indeed the first hint of India's stance on the use of nuclear weapons; New Delhi saw little purpose in using nuclear weapons first.

A relatively fuller explanation of India's future policy regarding the use of nuclear weapons was explicated in a paper tabled in Parliament on 27 May, followed by a statement by the Prime Minister on the same day. For the government, harnessing the power of nuclear weapons was accompanied by a sense of responsibility: 'India shall not use these weapons to commit aggression or to mount threats against any country'.³⁵ For instance, it offered a no-first-use pledge to Pakistan. Also, assuring the world that New Delhi would eschew any nuclear arms race, the statement declared a voluntary moratorium on further nuclear testing. For the time being, it did appear that India's nuclear policy would not 'subscribe or reinvent the doctrines of the Cold War'.³⁶

In subsequent remarks, the Indian Defence Minister categorically declined any movement towards developing TNWs meant for nuclear warfighting; India's nuclear forces had to be a purely 'strategic deterrent'.³⁷ India's nuclear command-and-control system would entirely be in the hands of the political leadership.³⁸ Influential strategic thinkers like K. Subrahmanyam and Jasjit Singh concurred. For Singh, the intention behind India's nuclear tests was not to venture into the territory of 'fighting nuclear wars', a mistake which the superpowers had committed during the Cold War.³⁹ Subrahmanyam, who had been for long articulating a vision of minimum nuclear deterrent, argued against deployment, targeting and alerting of India's nuclear capability.⁴⁰

It was only towards the end of 1998 that the government articulated its most detailed view on nuclear weapons in India's defence posture. Addressing the Indian Parliament in December 1998, the Prime Minister outlined the basic principles which were to guide India's nuclear deterrent.⁴¹ First, New Delhi announced that it would follow a policy of 'no-first-use' against NWS, and of 'non-use' of nuclear weapons against non-NWS. Second, the shape of India's arsenal would be defined by a

'minimum credible deterrent'. This entailed the 'deployment of assets' that could ensure 'survivability and capacity for an adequate response'. In fact, these sets of statements distilled to a deterrence doctrine which was entirely 'retaliatory' in nature. The quantum of retaliation was also the bare minimum, defined merely by 'adequate response'.⁴²

If these consisted of individual statements on Indian nuclear intent from members of its political leadership, the process of institutionalising its nuclear policy was also underway. In its election manifesto, the now-ruling BJP had promised to establish the NSC. The mandate of the new institution was to produce India's first ever strategic defence review 'to study and analyse the security environment and make appropriate recommendations ... and evaluate the country's nuclear policy and exercise the option to induct nuclear weapons'.⁴³ Though preparations for establishing the NSC had begun in March 1998, when the newly elected government formed a three-member task force to advise the leadership over the constitution of the NSC, the tests were conducted a month before the task force submitted its preliminary report in June 1998. Clearly, the BJP had jumped the gun in its own order of priority by conducting the tests in May 1998, much before the NSC was even established to undertake the strategic defence review that would presumably assess nuclear options for India.⁴⁴ However, India's nuclear tests, followed by those of Pakistan, rendered the idea of a prior strategic defence review redundant for defence policymakers. Therefore, the first task which fell upon the NSC, when it was finally established in November 1998, was to promulgate a nuclear doctrine for India. Indeed, as the Prime Minister announced in Parliament on 15 December, the NSC was tasked with making 'important contributions in elaborating the concepts' of India's nuclear deterrent.⁴⁵

The NSC constituted a three-tier structure: a Strategic Policy Group comprising civilian and military officials; a 22-member NSAB consisting of former bureaucrats, military officials and scientists, but also a few academics and journalists; and last, a Secretariat, which would also include the JIC. Whereas Vajpayee's Principal Secretary Brajesh Mishra assumed the role of NSA, the veteran defence official and leading strategic thinker K. Subrahmanyam was named the convener of the NSAB. The task to promulgate a nuclear doctrine fell upon a select few within the NSAB. A sub-committee was formed within the NSAB, constituting of K. Subrahmanyam, M. K. Rasgotra, Raja Ramanna, Bharat Karnad and General S. F. Rodriguez.⁴⁶ For eight months following its establishment

in mid-December 1998, the NSAB ruminated over the draft framework prepared by the above-mentioned sub-committee, which would guide India's nuclear deterrent. The DND, as prepared by the NSAB, was finally unveiled on 17 August, 1999 by the NSA Brajesh Mishra. The doctrine, as Mishra explained, was a step towards 'greater transparency' in India's nuclear decision-making.⁴⁷ Mishra reiterated the path underlined by the political leadership earlier in 1998: the policy of 'minimum deterrence' along with the pledge of 'no first use' as 'the building block of our (India's) nuclear thinking'.⁴⁸

One member of the draft sub-committee has argued that the NSAB doctrine was merely an exercise in institutionalising the benchmarks of nuclear deterrence which had already been set by the government in the various statements of 1998.⁴⁹ This observation is indeed interesting because most members of the NSAB were proponents of 'minimum deterrence' and no-first-use, an observation made consistently in this chapter. Others, however, argued that, given that the NSAB worked on the principle of consensus, the ultimate document was thus an accommodation of many viewpoints.⁵⁰ It is also reported that along with the NSAB, the Indian Army and DRDO also formulated a nuclear doctrine.⁵¹ It is not clear, however, what exactly the differences were between these different approaches to the nuclear doctrine.

The DND of 1999, in its preamble, laid out the reasons for India going nuclear: nuclear weapons bolster strategic autonomy in decision-making; they provide the security essential for India's development; and last, the existence of nuclear weapons in the hands of other states, including 'offensive nuclear doctrines pertaining to first use of nuclear weapons' and those doctrines that included nuclear use against non-NWS, constituted a threat to Indian security.⁵² The doctrine claimed that 'India will pursue a policy of credible minimum nuclear deterrence'. Such 'minimum deterrence' would require 'sufficient, survivable and operationally prepared nuclear forces'; a 'robust command and control system'; 'effective intelligence and early warning capabilities'; 'comprehensive planning and training for operations in line with the strategy'; and the 'will to employ nuclear forces and weapons'. To fulfil the requirements of 'minimum deterrence', the doctrine envisaged a nuclear force structure consisting of a triad of 'aircraft, mobile land-based missiles and sea-based assets'. Effective deterrence also entailed a capability to convert peacetime deployment into employable forces in the shortest possible time, and to

survive any 'significant degradation' (meaning first-use) by the enemy and to retaliate effectively.⁵³

The credibility of retaliatory capability, survivability of nuclear assets and effectiveness of deterrence, as the doctrine argued, would guide Indian nuclear deterrence. However, three subtle changes differentiated this 1999 doctrine from what had been articulated by the government in 1998. First, the non-use of nuclear weapons against non-NWS, also called negative security guarantees, now kept out of its scope those non-nuclear states that were aligned to a nuclear power. This was clearly a deviation from the absolute negative security guarantees offered by Vajpayee in his December 1998 speech. The NSAB never provided the rationale for such a shift. As Rajesh Rajagopalan has argued, this would have been influenced by the need to deter states who themselves are not nuclear, but nevertheless host nuclear assets of other NWS.⁵⁴

Second, the quantum of retaliation in case the deterrent failed was now deemed 'punitive' in nature, replacing the earlier idea of an 'adequate response'.⁵⁵ This shift again remained unexplained, but the use of punitive retaliation suggested a clear commitment to absorbing the first strike, and retaliating at a time and place of India's choosing. It also guaranteed flexibility of response. Last, whereas until 1998 official statements appeared to insist upon the 'minimum' nature of India's credible deterrent, by 1999, the emphasis shifted towards the 'credibility' aspect of the deterrent. This was most evident in the nature of nuclear forces that the doctrine envisioned: an open-ended nuclear force consisting of all possible delivery systems.

The doctrine was critically received by both domestic and international sources. Pakistan's Ambassador to the Conference on Disarmament (CD)—Munir Akram—ridiculed India's no-first-use pledge: Indian promises to use nuclear weapons only in retaliation, in his reading, were simply 'incredible'.⁵⁶ The growing gap in conventional power between the two countries, as Akram stated, will 'intensify Pakistan's reliance on its nuclear capabilities' to deter the 'threat of aggression and domination by India'.⁵⁷ Clearly, if India was signalling its intent to keep nuclear weapons confined to deterrence, Pakistan was keen on linking the nuclear and the conventional.

The US was equally rattled by India's expansive formulation of its nuclear posture. As Strobe Talbott has argued in his recollections of the ongoing nuclear dialogue with India, the 1999 nuclear doctrine was 'the

worst possible answer to the question of how India intended to define "credible minimum deterrence" ... If implemented, it could give India an arsenal not just equal to but bigger than either Britain's or France's, and it would surely provoke an acceleration of China's nuclear buildup.⁵⁸ When, in December 1999, during one of the meetings under the nuclear dialogue, the US raised 'strong objections' to the DND, India's principal interlocutor—Jaswant Singh—argued that the DND 'should not be taken seriously' and that the US should not 'dignify it (DND) by overreacting'.⁵⁹ Jaswant Singh had also promised the Americans a review of the DND.

TOWARDS THE OFFICIAL DOCTRINE: 1999–2003

Given such criticisms, the Indian government was keen to review, or at least reshape, perceptions of the doctrine. The most important challenge was to salvage the idea of 'minimum deterrence' from the expansive articulation of India's nuclear force posture in the doctrine. In the general debate in the First Committee, the permanent representative of India to the UN in Geneva argued that 'the minimum deterrent posture, based on the self-evident principle of "more is not better when less is adequate" governs the quantum as well as operational mode of our nuclear policy'.⁶⁰ The conditions imposed on India's negative security guarantees by the doctrine—of use against non-NWS aligned to NWS—were also removed.

In November 1999, Jaswant Singh formally declared such course corrections in his interview to C. Raja Mohan.⁶¹ He argued that it was a 'misperception' to view the 1999 doctrine as India's official nuclear doctrine. Calling the NSAB a group of 'non-official' strategic experts and policy analysts, he suggested that the doctrine was only intended to initiate a larger political debate in the country. It was, in his words, not a 'policy document of the Government of India'. Encapsulating India's nuclear doctrine from the official statements made by the political leadership a year before, he stressed the no-first-use pledge, which also, according to him, implicitly contained the 'principle that India shall not use nuclear weapons against non-nuclear weapon states'.

He addressed two issues concerning the doctrine in detail: the idea of 'minimum deterrence', and the kind of retaliation against nuclear use by an adversary. Emphasising the essentially political nature of nuclear weapons, he precluded the possibility of nuclear warfighting concepts in

India's strategic view of nuclear weapons; they were principally directed towards deterring their 'use by an adversary'. However, a 'retaliation only' nuclear doctrine could only be credible if the forces can survive the threat of a first strike. It is important to underline the fact that, at this point, 'credibility' was only a function of 'survivability', rather than vice versa. Insofar as survivability ensured that a risk of retaliation was posed to an adversary, the risk, rather than the certainty, of retaliation provided India with the element of deterrence. This was also evident in Singh's dismissal of the idea of a triadic force structure, which he considered premature in India's case: '... just as parity (of forces) is not essential for deterrence, neither is a triad, a pre-requisite for credibility'.⁶²

This comment on parity of forces is important because, as Rajesh Basrur has argued, a true 'minimum deterrence' doctrine is contingent upon such a 'risk' rather than on the certainty of a credible second strike.⁶³ Given that only a small number of Indian nuclear weapons would ensure that the adversary could never fully mitigate the risk of retaliation, a minimum nuclear arsenal could provide effective deterrence.⁶⁴ However, Singh was categorical in stating that the 'minimum' in India's nuclear doctrine was not a fixed entity: rather, it was a 'dynamic concept but firmly rooted in the strategic environment, technological imperatives and national security needs'. The 'size, components, deployment and employment of nuclear forces' were, in turn, dependent upon such variables.⁶⁵ On the one hand, Singh's postulations can be seen as deliberate nuclear sophistry in order to keep the options open for the expansion of India's nuclear arsenal in the future; on the other, it needs to be appreciated that he was trying to balance the internal criticisms of 'minimum deterrence' with external concerns about what appeared to be an open-ended nuclear force structure.

Insofar as India's retaliatory strategy was concerned, Singh argued that it would be based on two factors: it should be assured and effective. An 'assured retaliation' strategy did not entail hair trigger alerts. It also obviated a posture of 'launch on warning' or 'launch under attack'; as Singh argued, retaliation does not have to be 'instantaneous'.⁶⁶ The 1999 doctrine, by postulating a requirement for the 'shift from possible peaceful deployment to fully employable forces in the *shortest possible time* (emphasis added)', and 'for a rapid response' in case India was attacked with nuclear weapons by an adversary, had portrayed a picture of prompt and rapid retaliation.⁶⁷ This, in an operational sense, entailed a more military-ready arsenal than Indian political decisionmakers were comfortable with at this time.⁶⁸

A number of reasons explained this preference among the political leadership. First, a ready arsenal laid onerous demands on India's material and technological capabilities. Just two years after the tests, India's nuclear forces were still in flux: the rudimentary nature of warheads and delivery capabilities had not yet achieved the necessary sophistication required for a ready arsenal. Moreover, the force posture was still undecided, as missile capabilities were still at a developmental stage. Even organisationally, the idea of a ready arsenal would place onerous demands on India's nascent command-and-control structure, as at that time, a unified nuclear command had not even been established; the SFC came into being only in 2002. As Tellis argues, it was 'more important for India to develop a response system that guarantees successful retaliation once nuclear attacks have occurred than to focus on developing the capability for meting out "immediate and instantaneous" reprisals'.⁶⁹

Political considerations were equally relevant. First, given that no-first-use could not be verified by any other objective standards, a form of recessed weapons deployment posture was an important way to operationally signal India's no-first-use commitment to its adversaries.⁷⁰ Second, a ready arsenal would also militate against India's sustained efforts towards the delegitimation of nuclear weapons; a policy which had, in fact, gained greater official emphasis in the wake of the 1998 weapons tests. In fact, the government had made it a major plank of its disarmament diplomacy, as evident in India's tabling of a proposal titled 'Reducing Nuclear Dangers' in the UN General Assembly Debate in 1998. This proposal largely focused on reducing the risks posed by hair-trigger postures and related doctrines of nuclear use.⁷¹

Last, a rapid response system would have entailed greater incorporation of the military—which was and is the final deliverer of India's nuclear arsenal—in the body-politic of nuclear decision-making. Traditionally, Indian civil-military relations have veered towards absolute control of the military by civilian decisionmakers; and the perennial threat of the 'man on horseback' ready to overtake political authority has defined interactions between the two.⁷² If this was true of civil-military relations in general, it was more so in the case of India's nuclear policy. Unlike all other major nuclear powers, the involvement of the military in India's nuclear decision-making has at best been minimal.⁷³ Even after overtly going nuclear, this fundamental structure of civil-military relations remained entrenched.

However, a nuclear arsenal characterised by high readiness could have upset this balance.

Notwithstanding the various versions of the doctrine, by the end of 1999, India's nuclear thinking on the use of its newly acquired nuclear capability distilled down to three broad principles.⁷⁴ First, at the declaratory level, India articulated a vision where nuclear weapons were 'more an instrument of politics rather than a military instrument of war fighting'.⁷⁵ In fact, India had abjured the idea of nuclear warfighting from the very beginning. Nuclear weapons were a political tool geared towards one single objective: to avert the threat of use or actual use of nuclear weapons by adversaries.

Nuclear weapons can be generally used through a range of nuclear strategies. These can include offensive disarming of the adversary through 'bolt from the blue' nuclear strikes; defensively denying an enemy the advantage in the battlefield accruing from its conventional military superiority through demonstration shots or use of TNWs; or simply using the threat of assured retaliation of nuclear weapons to deter an adversary from using its nuclear weapons to blackmail or coerce the defendant. India's avowed doctrine has squarely rested with this third option.⁷⁶ To this end, New Delhi rejected the development of TNWs. India's pledge of non-use of nuclear weapons against all non-NWS appeared to be absolute. This latter point has been upheld despite some early disruptions caused by potential linkages in the 1999 doctrine of use of nuclear weapons against those who were non-nuclear, but allied to NWS, thereby threatening to condition India's negative security guarantees.

Second, the pledge of no-first-use was firmly in place, with hardly any conditions attached to the concept. In fact, soon after the nuclear tests, India again reiterated its intentions to sign a no-first-use agreement with Pakistan, which had first been mooted in the year 1994. Within the NSAB, there was substantial debate on the viability and effectiveness of a no-first-use pledge. Criticisms included its perceived incredulity to India's likely nuclear adversaries, especially Pakistan, and the possibility that India might itself not adhere to a no-first-use commitment if facing a disastrous defeat in a conventional war with China.⁷⁷

However, Indian decisionmakers viewed no-first-use as a risk worth taking, for both political and military reasons. First, it comported well with India's overall nuclear philosophy that nuclear weapons could never be used in the battlefield. Since nuclear weapons were only for deterrence,

any first-use of nuclear weapons was out of the question. Second, no-first-use also radiated the image of a responsible and restrained nuclear power, a perception which New Delhi was desperate to disseminate, largely because, rather than remaining an outlier in the nuclear order, it wanted to be accommodated into the system. The nuclear dialogue with the US, at least in the Indian scheme of things, was principally motivated by these considerations. It also helped in dispelling fears that India was venturing into domains of unlimited nuclear force construction; on the other hand, a first-use nuclear approach would have entailed the development of massive nuclear infrastructure.

Last, the military contingencies confronting India were still manageable through conventional means, as then assessed by New Delhi. *Vis-à-vis* Pakistan, India had both a conventional and a nuclear edge. Although India was conventionally weaker than China, the India–China rivalry was far more stable compared to the volatility evident in India's rivalry with Pakistan. Being a status quo power, India's limited but formidable military means translated into local military advantage along the LAC with China. Most reassuring for India was the fact that China was the only country among the five recognised nuclear powers which adhered to a no-first-use doctrine. The first-use of nuclear weapons, therefore, neither fit India's traditional world view, nor did it make political or military sense to its decision-making elites. Nuclear coercion or nuclear use by an adversary could only be deterred through a threat of counter-use or actual counter-use explicated in India's retaliatory posture.

The third important aspect of the ideological component of New Delhi's nuclear deterrence was thus centred on India's responses to the threat of use of nuclear weapons by its adversaries, or the actual use of nuclear weapons in case deterrence breaks down.⁷⁸ Underlying India's retaliatory posture was, first, an admission of the fact that nuclear weapons could only be used to threaten punishment to the adversary for its nuclear blackmail, or actual punishment in case of a real nuclear use against India. Since New Delhi insisted upon nuclear weapons as political instruments and pledged a no-first-use policy, the use of nuclear weapons as elements of coercion or defence was already out of the equation. Deterrence via punishment was the logic behind India's nuclear posture of assured retaliation. Second, as far as the rapidity of such punishment was concerned, Jaswant Singh's interview with C. Raja Mohan had settled the debate in favour of a delayed but certain punishment. This entailed that India would

absorb a first strike or first-use of nuclear weapons. It also signalled that India's response, though guaranteed, would not be immediate. Last, on the issue of the quantum of punishment, India's nuclear doctrine was moving towards a more muscular approach. From 'adequate response' in December 1998, to 'punitive retaliation' in August 1999 and to 'assured retaliation' in November 1999, the quantum of punishment appeared to be on an ascendant trajectory.

Two factors might explain this shift. First, from the very start, Pakistan was trying to link the nuclear and the conventional, suggesting that it may use nuclear weapons in case of a conventional war with India. Decisionmakers in New Delhi clearly wanted to put a stop to such linkages. Second, the experiences of the Kargil War, in which Islamabad resorted to veiled nuclear blackmails, may have prodded India into increasing the quantum of nuclear punishment. In fact, during the Kargil War, Indian decisionmakers suggested that in response to any use of nuclear weapons by Pakistan, New Delhi 'would go all out', and the effects for Pakistan would be catastrophic.⁷⁹ While India could threaten the complete obliteration of Pakistan, given its geography and India's nuclear arsenal, this was simply not a credible threat to make against China, which was geographically much larger than Pakistan, and also possessed a vastly superior nuclear arsenal to that of India.⁸⁰ This shift towards a more muscular retaliatory approach was evident, and would reach its zenith in the later formulation of 'massive retaliation'. However, this new formulation would only be delivered with the official enunciation of the nuclear doctrine in 2003.

CONCLUSION

This chapter has traced the evolution of Indian nuclear thought, from initial responses to the Chinese nuclear test in 1964, to the reconsiderations of India's nuclear approach following the release of the 1999 doctrine and in response to the Kargil War experience. It has found that 'minimum deterrence', and how best to operationalise it, constituted the dominant strand in Indian nuclear thought in this period. Thinking flowing from this concept distilled into a preference for assured retaliation over nuclear warfighting, reduced arsenal readiness and no-first-use. However, in response to strategic pressures that India faced in this later period, as was explained in Chapters 2 and 3, Indian decisionmakers and strategic

analysts began revising upward the level of nuclear retaliation that an adversary could expect in response to its first strike upon India. This reflected a growing interest in efforts to develop the 'credible', as opposed to the 'minimum', nature of India's emerging nuclear force at this stage, a trend that continued from 2003 onwards, and which we will investigate in Chapter 5.

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74. Tellis, *India's Emerging Nuclear Posture*, pp. 261–366.

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77. Bharat Karnad, 'A Thermonuclear Deterrent', in Amitabh Mattoo, ed. *India's Nuclear Deterrent* (New Delhi: Har Anand Publications, 1999), p. 120.

78. Although in deterrence literature, the elaborate planning of a retaliatory use of nuclear weapons is primarily motivated towards maintaining deterrence in the first place.

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80. Tellis, *India's Emerging Nuclear Posture*, p. 338.

New Challenges for the Indian Nuclear Doctrine

The Doctrinal Debate, 2003–Present

This chapter will analyse the official Indian nuclear doctrine unveiled in 2003. It will then progress to examine Indian nuclear strategic thought from the announcement of this doctrine until the present day. The doctrine and tenor of the debates that have followed demonstrate continued strong support for the concept of ‘minimum deterrence’; but they also reveal growing tensions due to rising pressure within and outside the government for doctrinal and force development measures that instead demonstrate ‘credible deterrence’. These unresolved tensions between ‘minimum’ and ‘credible’ have now reached the stage at which an official strategic defence review is required to determine, at the political level, how the balance between these two imperatives will be struck.

INDIA’S OFFICIAL NUCLEAR DOCTRINE OF 2003

India’s official nuclear doctrine was finally promulgated in January 2003. It took approximately three years for the Indian government to review and revise the 1999 doctrine. The interlude between the 1999 and 2003 doctrines, as we saw in Chapter 4, evidenced a vigorous domestic debate on India’s nuclear approach. For New Delhi, particularly disconcerting was the fact that the emerging nuclear environment in the sub-continent created complications for India’s nuclear strategy. Emboldened by its possession of a nuclear umbrella, Pakistan’s military initiated a limited land-grab exercise in the Kargil sector of Indian Kashmir.¹

The Kargil War was fought under a nuclear shadow; India confined its military action within its border, and successfully pushed out the

infiltrators in a two-month military campaign, but only after incurring substantial casualties.² Even though conventionally stronger, India could not exert its power over Pakistan for the fear of nuclear escalation.³ Pakistan was effectively using the nuclear shadow to foment sub-conventional or proxy war in India's troubled region of Jammu and Kashmir and also beyond to the Indian heartland.

In just over two years after the Kargil War, a major crisis erupted again when the Indian Parliament was attacked by Pakistan-sponsored terrorists in December 2001. In an act of coercive diplomacy, India amassed more than half a million of its troops alongside the international border, in what was christened Operation Parakram.⁴ Frantic mobilisation and gruelling deployments cost India the lives of close to 800 soldiers, with approximately \$2 billion spent on mobilisation alone.⁵ India demobilised after nine months, with only a rhetorical assurance from Pakistan that it would not support terrorism against India.

Some have argued that part of the reason for India's restraint was the desire to project itself as a responsible nuclear state, and thus draw a contrast with Pakistan's risk-taking attitude, thereby accumulating international, and especially American, goodwill.⁶ Such an approach would eventually help New Delhi to build a strategic relationship with Washington, ease sanctions on technology transfers and finally be accommodated in the international nuclear order. However, a major driver of this Indian restraint flowed from nuclear dynamics in the sub-continent. Pakistan's strategy of linking the nuclear and conventional domains had actually succeeded in limiting India's conventional options. Veiled nuclear threats from Pakistan during the 'Twin Peaks' crisis of 2001–02 were commonplace, but even India's decision to demobilise in autumn 2002 was read by Pakistan as a victory of its nuclear deterrent.⁷ For President Musharraf, it was 'South Asia's strategic balance and Pakistan's conventional and nuclear weapons that had deterred India ... India's hesitation, frustration and inability to attack Pakistan in a so called limited war were premised upon Pakistan's nuclear prowess.'⁸ If India had gone nuclear to avoid nuclear blackmail, Pakistan's overt support of sub-conventional forces against India and its strategy to escape Indian conventional retribution by promising first use of nuclear weapons in the battlefield were clearly negating the advantages that India had intended to gain from its possession of a nuclear deterrent.

Notwithstanding the nuclear blackmail from Pakistan, two other developments in India's neighbourhood were equally disconcerting

for Indian nuclear deterrence. First, after the September 2001 terrorist attack on the US, a global concern over the acquisition of nuclear weapons by terrorist networks such as Al-Qaeda gained immediate priority in the security calculus of states worldwide.⁹ India's immediate neighbourhood—Pakistan and Afghanistan—had been a safe haven for international terrorism for more than a decade. Therefore, the threat that such non-state entities could acquire nuclear assets in the future also became a security concern for the Indian government.¹⁰ Second, the A. Q. Khan proliferation network, which sold nuclear secrets like uranium enrichment technologies to countries such as Libya, Iran and North Korea was publicly exposed by the US during this period.¹¹ Although the Indian government had long been communicating its concerns regarding Pakistan's proliferation to the US and other states, the extent of such activities was indeed alarming. These factors created a perception among Indian decisionmakers that India may be facing an invisible nuclear threat in the future, probably backed by states who have traditionally engaged in sponsoring terrorism, while plausibly denying having done so.

One last factor at the international level which influenced India's nuclear thinking in this period was the change accompanying the US nuclear strategy with the coming of the Bush administration. On 1 May 2001, President Bush promulgated a 'new framework for security and stability' in a speech on new emphasis on missile defence systems to mitigate nuclear threats at the National Defense University.¹² Explaining the new role of missile defence in American nuclear strategy, Bush argued that 'Deterrence can no longer be based solely on the threat of nuclear retaliation ... Defenses can strengthen deterrence by reducing the incentive for proliferation.' In part, this was motivated by what he described as the American commitment to 'a credible deterrent with the lowest-possible number of nuclear weapons consistent with our national security needs, including our obligations to our allies', and to 'reduce its nuclear forces quickly'.¹³ However, it was equally responsive to the new threats which were emerging on the nuclear horizon: transnational terrorist networks, development of ballistic missiles by states with malevolent interests toward the US, and also the perceived increasing risk of nuclear proliferation from Iran, North Korea and Iraq. Some of these threats would take a new dimension with the events of September 11, and also with the exposure of A. Q. Khan's proliferation network.

What was also promising in Bush's speech, especially for India, was the fact that this new approach was 'premised on openness, mutual confidence and real opportunities for cooperation, including in the area of missile defense'.¹⁴ If the threats underlined by President Bush comported well with India's own security perceptions, India could also take advantage of his offer of international missile defence technology cooperation, just as it had in the past for the similar nuclear technology cooperation offer made by Eisenhower through his 'Atoms for Peace' initiative.¹⁵ Additionally, the seeming repudiation by Bush of the Cold War international nuclear order chimed with an Indian government that had long sought accommodation for its nuclear status in global nuclear policy arrangements.¹⁶ While all these above factors would support India's eventual decision to integrate missile defence into its strategic force development, this transition would only occur after the enunciation of its official nuclear doctrine in January 2003.

Such was the internal, regional and international backdrop against which India announced its official nuclear doctrine through a press statement on 4 January 2003.¹⁷ Compared to the elaborate document which accompanied the 1999 doctrine, this statement was laconic and succinct. Although the overall tenor of the doctrine remained the same, a number of major changes were easily visible.¹⁸

First, India's no-first-use pledge looked highly compromised. Following domestic pressure on the pledge, reportedly to the extent that the NSAB recommended its revocation in December 2002, the new doctrine introduced major concessions to it.¹⁹ New Delhi now declared its right to use nuclear weapons in case Indian armed forces were attacked with Weapons of Mass Destruction (WMD) anywhere in the world. The motivation for this conditionality originated from India's experiences during both the Kargil War and especially the 'Twin Peaks' crisis of 2001–02. It was a response to Pakistan's threat to use nuclear weapons against India in a conventional battlefield. But in doing so, it also equated chemical and biological weapons with nuclear weapons: the use of any such weapons could invite an Indian nuclear retaliation. However, discerning the origins of the new Indian equivalence of chemical and biological weapons for nuclear weapons was difficult. As Rajesh Rajagopalan has argued, India by now had become a party to the Chemical Weapons Convention (CWC), and legally forfeited chemical weapons. The Indian decisionmakers therefore might have felt vulnerable

to attack against these other weapons of mass destruction in the absence of a similar deterrent force.²⁰

The second major change which accompanied the official doctrine pertained to the quantum of punishment in Indian retaliation to nuclear first-use by an adversary. As has been argued, by the end of 2000, India's nuclear doctrine was moving towards a more muscular approach in terms of the quantity of punishment to be delivered in its nuclear retaliation. Following a similar trend, the new official doctrine declared that 'nuclear retaliation to a first strike will be massive and designed to inflict unacceptable punishment'.²¹ In deterrence literature, the difference between 'punitive retaliation' and 'massive retaliation' is substantial; the former allows flexibility in response, whereas the latter has no room for concessions. 'Massive retaliation' necessitates that the retaliating state attack the adversary with all its nuclear might.

Last, there appeared to be a change in the order of priority between 'credible' and 'minimum' in the force posture of 'credible minimum deterrence': while earlier texts and enunciations of the doctrine always prioritised 'minimum' over 'credible' (at least in the sequence of these words), the 2003 document puts 'credible' before 'minimum'. In the earlier avatars of the doctrine, if the mere risk of a retaliatory exchange appeared to have provided India with the requisite nuclear deterrent, the emphasis had now shifted to the credibility of India's nuclear retaliation. As Scott Sagan has argued, the emphasis on credibility pointed toward a greater increase in arsenal size than would be necessary under the 'finite deterrent posture' entailed by a doctrine of 'minimum deterrence'.²²

2004-08: RELATIVE CALM

By the start of 2003, the Indian nuclear doctrine had established new caveats on its no-first-use policy, set its retaliatory response to the most destructive level possible, and shifted the emphasis from 'minimum' to 'credible' in its nuclear force posture. As has been outlined above, these revisions were largely responses to its changing strategic context. In 2004, there was a change in the government, with the Congress-led United Progressive Alliance (UPA) taking office in New Delhi. This new government accepted the 2003 official doctrine and attempted no change in India's professed nuclear outlook.

Although the official nuclear doctrine appeared frozen at this point, changes were taking place at the level of conventional warfighting doctrines. The Kargil War, and especially Operation Parakram in 2001–02, had laid bare the fact that Pakistan was actively using the nuclear cover to foment sub-conventional or proxy war by holding India's conventional superiority hostage to its nuclear capability.²³ By 2004, Indian defence forces had also started responding to this strategic imbroglio in the sub-continent by tinkering with their conventional warfighting doctrines and finding a way out of the impasse engendered by Pakistan's present posture of nuclear first use in a conventional battle.²⁴ In general, one major doctrinal push argued by the votaries of change in India's military strategy was to move away from the logic of defence to one of offence.

It was against this background that the Indian Army announced its new doctrine in April 2004, officially called the Indian Army Doctrine 2004.²⁵ The new doctrine sought to address problems confronted by the Army between 1999 and 2003.²⁶ First, by intending to convert its lugubrious and unwieldy strike Corps into smaller integrated battle groups (IBGs), the Army addressed the problem of the 'mobilisation differential' it had confronted during Operation Parakram. By mobilising quickly, as the IBG concept intended to, India could press for surprise both against Pakistan and the international community. Second, this new doctrinal push suggested that the Indian Army had by now institutionally accepted the logic and necessity of limited rather than major war planning.²⁷ Last, it also meant that defence-dominated thinking was giving way to new offensive concepts.²⁸

The IAF promulgated its own revised doctrine in 2007, which is not in the public domain. However, a few strategists who have explicated on the doctrine also suggest that the IAF was responding to the new strategic situation in the sub-continent.²⁹ As a retired Vice Chief of Air Staff and member of the NSAB had argued in 2003, 'Deterrence against large scale conventional and nuclear war is best provided by air power.'³⁰ Even in terms of deterring Pakistan from initiating a sub-conventional war against India, the IAF considers itself the primary instrument of punishment, providing various options to Indian decisionmakers. As the above retired IAF officer put it, the IAF 'provides greater flexibility in choice of operating bases, selection of targets, target systems and geographical area of operations', especially when the need is to 'carry the conflict across the border or the Line of Control'.³¹ Moreover, it was claimed that the IAF did

not suffer from a 'mobilisation differential' as compared to the lugubrious preparations necessary in employing the Indian Army to punish Pakistan.³²

However, despite the above developments, the broader Indian nuclear doctrinal debate did not evidence major shifts during the period 2004–08. A number of reasons may explain this relative calm in India's doctrinal thought. First, the 2003 doctrine had attempted to provide the cover of 'massive retaliation' if nuclear weapons or other WMDs were used against India's armed forces fighting a conventional battle against Pakistan, in response to acts of sub-conventional warfare. The Indian armed forces were also actively preparing for such eventualities, as evident in their doctrinal and organisational revisions as well as their training and exercises.³³ Second, no major incident of sub-conventional warfare, comparable to Kargil or the attack on Parliament, occurred during this period. This could suggest that the changes in nuclear and conventional strategies may have induced caution in Pakistan's support to terrorist networks. At least, without the occurrence of such acts, there was no reason to believe otherwise. Moreover, India's new strategies could only be tested under such circumstances.

Third, post-2004, India's relations with both Islamabad and Beijing were on an upswing. Leaked diplomatic cables confirm that India and Pakistan came very close to solving the Kashmir issue based on a 'non-territorial solution'.³⁴ Pakistan had made promises to both Prime Minister Vajpayee in 2003, and later to Prime Minister Manmohan Singh in 2005, to curb terrorist activity emanating from its soil. For a while, as was argued in the previous point, Pakistan appeared to be making good on its promises. After the tumults which the 1998 tests had created in Sino-Indian relations, Vajpayee had undertaken a historic visit to Beijing in 2003, and some strides in solving the boundary dispute were also made.³⁵ In fact, relations with Beijing approached their highest point of the last two decades.

Fourth and most important, this was also the period when India was negotiating its inclusion in the international nuclear regime through a civilian nuclear agreement with the US. One of the major arguments in support of the deal, made both in Washington and New Delhi, was that a 'responsible nuclear power' such as India must be accommodated into the system. The idea of nuclear restraint was fundamental to the image of a 'responsible nuclear power'. 'Restraint' and 'responsibility' were India's mantras in explaining its nuclear behaviour since the nuclear tests in May

1998. Speaking in Parliament on 27 December 1998, Prime Minister Vajpayee had stated that 'India is now a nuclear weapon state ... our strengthened capability adds to our sense of responsibility', and that its 'nuclear policy' would be marked with 'restraint and openness'.³⁶

This concept of responsibility would subsequently be showcased in elements of India's foreign and nuclear policy, and also in its behaviour.³⁷ Soon after the tests, India had declared a unilateral voluntary moratorium on further nuclear testing and had acquiesced, at least in principle, to signing the CTBT and negotiating the FMCT.³⁸ It started working with the US to implement strict export control laws in order to check nuclear proliferation.³⁹ Having adopted an overtly nuclear status, India also appeared to be changing its traditional opposition to the international nuclear non-proliferation regime by claiming that it had been a 'responsible member' and 'will continue to take initiatives and work with like-minded states to bring about stable, genuine and long-lasting non-proliferation'.⁴⁰

India's military restraint, in both conventional and nuclear domains, was equally visible. Even after being attacked repeatedly either by Pakistan's regular forces, as was the case in Kargil, or by terrorist elements supported by Islamabad during the terrorist strike on Indian Parliament in December 2001, India's response remained limited. Though such limited responses were in part a result of the nuclear shadow over the sub-continent, it nevertheless generated substantial international sympathy for India's situation. It was not without reason that when the US finally declared its intention to negotiate a civil-nuclear agreement with India in July 2005, President Bush justified this shift as a long-held US policy on nuclear non-proliferation. He claimed that 'as a responsible state with advanced nuclear technology, India should acquire the same benefits and advantages as other such states'.⁴¹ Prime Minister Manmohan Singh was equally emphatic about India's assumption of the responsibilities, which would occur with its gaining the status of a normal nuclear state: 'India would reciprocally agree that it would be ready to assume the same responsibilities and practices and acquire the same benefits and advantages as other leading countries with advanced nuclear technology such as the United States'.⁴² Given that responsibility and restraint were the premises on which the proposed agreement was being justified to the world, and that strategic rivalries with China and Pakistan appeared then to be relatively stable, it would have made good diplomatic sense for India not to publicly revise its nuclear doctrine at that time.

POST-2008: THE DOCTRINAL DEBATE REIGNITED

The November 2008 terrorist attacks in Mumbai, in the words of Prime Minister Manmohan Singh, had 'shocked the nation'.⁴³ The danger lay in a sudden deterioration of the security situation in the sub-continent; as *The Economist* explained, if 'suspicions point to a Pakistani involvement ... the slow thawing of relations between the two hostile neighbors will revert to the deep freeze'.⁴⁴ The Indian government emphatically stated that the attackers had come from Pakistan; the US concurred.⁴⁵ As US Ambassador to India David Mulford reported to the State Department, 'There is war fever here. I don't know if the Prime Minister can hold out. Everyone knows that the terrorists came from Pakistan.'⁴⁶

India eventually did not launch a war in response to the Mumbai attacks. There were two plausible reasons behind eschewing military action. First, the Indian armed forces neither had the capability to successfully execute their limited warfighting doctrines, nor could they ensure that military action would not escalate to major war and a possible nuclear exchange.⁴⁷ A second factor was the absence of political will in New Delhi. In recollecting the deliberations of the CCS on possible responses, the then Chief of Air Staff Fali Homi Major observed that 'the government never made its mind to go to war'.⁴⁸

The lessons of the Mumbai episode and India's difficult choices were apparent to Indian decisionmakers. As former NSA Ambassador Menon reminisced later, 'Pakistan's nuclear shield permits Pakistan to undertake terrorist attacks on India without fear of retaliation. This may well have figured in the Pakistan Army's calculations behind the Mumbai attack of 26 November 2008.'⁴⁹ Mumbai therefore reignited the doctrinal debate. The changes introduced in the 2003 nuclear doctrine, and subsequent Indian enunciations of conventional limited warfighting doctrines, had evidently not improved India's strategic situation regarding Pakistan. Moreover, there appeared to be a mismatch between India's actual conventional warfighting capabilities and those that the respective new doctrines demanded. The Indian domestic reaction to the Mumbai attacks also extended to questions being raised regarding the state of nuclear force operationalisation. Until 2008, the government had remained discreet regarding the process and ability of India's nuclear force to be deployed in a situation of deterrence breakdown. The fact that the military and strategic analysts had pointed towards a lack of 'political will' to militarily respond to the Mumbai

attacks also raised concerns regarding the credibility of the Indian nuclear doctrine. Would civilian decisionmakers ever possess the political intent to order massive nuclear retaliation against an adversary, as pledged by the 2003 doctrine?

While this question continued to dominate India's conventional and nuclear strategic thinking, a further sense of vulnerability was created by Pakistan's growing nuclear arsenal and miniaturisation of weapons for battlefield use. Alarming reports were produced by reputable international sources such as the *Bulletin of the Atomic Scientists*, assessing that Pakistan had more than doubled its nuclear arsenal over the last decade.⁵⁰ Such rapid vertical proliferation of the Pakistani arsenal was complimented by its diversification. Islamabad was developing plutonium-based weapons, which require less fissile material, are smaller in size and easier to transport in terms of logistics. These concerns were further bolstered by the news that Pakistan had successfully miniaturised nuclear warheads and developed short-range ballistic missiles for battlefield use.⁵¹

Since India had traditionally rejected nuclear warfighting doctrines, it had also, at least in its official pronouncements, eschewed the development of tactical nuclear capabilities. Aside from this resulting gap between India and Pakistan regarding their tactical nuclear capabilities, Pakistani TNWs also brought into question the credibility of India's retaliatory posture of 'massive retaliation': would India risk nuclear Armageddon in response to limited nuclear use by Pakistan? Pakistan's development of 'full spectrum deterrence', involving intentions to field a specific nuclear force package ready for every conceivable level of conflict with India, has therefore raised substantial concerns for India.⁵²

Although India's nuclear deterrent had traditionally remained focused on Pakistan, the deterrence gap with Beijing was a factor of growing concern in New Delhi.⁵³ China's assertive behaviour in the Asia-Pacific, as part of its increasingly aggressive post-2008 foreign and security policy approach in general, generated further anxieties. Indian strategists noted that China was modernising its nuclear arsenal, adding new capabilities such as the DF-21 and DF-25 missiles, and anti-satellite weapons, which could be used to target India's command and control.⁵⁴ Beijing had also reportedly diluted its no-first-use policy insofar as it reserves a right to use nuclear weapons in its own territory. For some strategists, the resultant effect of this disclaimer may be a Chinese first-use in the Indian territory

of Arunachal Pradesh, which is also claimed by Beijing.⁵⁵ The deterrence gap with Beijing therefore appeared substantial and widening.

India's own emerging capabilities had also started generating pressures on its nuclear doctrine. Since the end of 2008, India has unveiled several major deterrent projects. In 2009, India's first nuclear submarine—the INS Arihant—was launched for sea trials. In April 2012, DRDO successfully test fired the 5,500 km-range Agni-V missile, bringing India closer to the select group of nations in possession of ICBMs. In 2013, DRDO also announced its plans of developing and equipping India's missiles with MIRVs, thus increasing the potential lethality of India's deterrent; the then DRDO chief V. K. Saraswat remarked that as the 'next logical corollary as far as the long-range ballistic missile deterrents capability of this country is concerned, we will switch over to force multiplication. Force multiplication in the case of ballistic missiles will be by way of multiple independently manoeuvrable re-entry vehicles (MIRV).'⁵⁶ It was during this period that DRDO claimed that India's indigenous BMD system development had been a resounding success; also, these technologies would soon be deployed to shield major metropolitan areas like New Delhi and Mumbai.

Other comparatively smaller but important technological changes, such as the canisterisation of delivery vehicles, accompanied India's rapidly developing capability.⁵⁷ Statements made by India's defence scientists, explaining the reasoning behind such changes, were especially problematic for India's nuclear doctrine and the tradition of 'minimum deterrence'. For example, the then DRDO Chief Controller of Strategic Systems, Avinash Chander, linked the necessity for the canisterisation of missiles to the credibility of India's second strike capability. Canisterisation would, in Chander's words, 'reduce the reaction time drastically', allowing for 'stop-to-launch' capability in a matter of minutes. This, in Chander's view, would build credibility into India's second strike posture, since 'in the second strike capability, the most important thing is how fast we can react'.⁵⁸ However, the Indian doctrine, as was explained by Jaswant Singh in May 2000, was one of assured retaliation, where the alacrity of response had no relationship to the credibility of the deterrent. Such doctrinal statements coming from defence scientists evidently created perceptions that India is moving towards a launch on warning posture. There is an additional negative impact, as a retired Strategic Forces commander argued in 2014: 'the statements by the scientists also prematurely release information on

delivery systems, which later become embarrassing when time lines are overshoot/delayed.⁵⁹

All these factors—the increasing lethality and range of Pakistan's arsenal, India's inability to resolve the conventional–nuclear dilemma, China's nuclear modernisation and the growing sophistication of India's nuclear capabilities—have ignited a domestic debate in India over the need to revise the doctrine. The fear of Pakistan's increasing nuclear arsenal led Jaswant Singh—India's former External Affairs and Defence Minister—to initiate a doctrinal debate in Parliament in March 2011.⁶⁰ Calling upon the political decisionmakers to revisit India's nuclear doctrine, he argued that the 'policy framework that the NDA devised in 1998 is very greatly in need of revision because the situation that warranted the enunciation of the policy of "no-first-use" or "non-use against non-nuclear weapons", "credible deterrence with minimum force", etc. has long been overtaken by events.'⁶¹

Rather than continuing with 'yesterday's policy', the need was to 'address' the problems confronting India.

Former SFC chiefs have also joined this debate. In an article written for *Force* magazine in June 2014, Lt Gen. B. S. Nagal argued that it is time for 'a dispassionate and critical evaluation of the (nuclear) doctrine'. Just like Jaswant Singh, Nagal criticised some of the fundamental premises of the Indian nuclear doctrine, such as no-first-use and 'massive retaliation'. Nagal claimed that while such ideas may have made sense in previous years, recent changes in the strategic environment necessitated a review of the doctrine.⁶² A former Chief of Naval Staff, Arun Prakash, and a former NSA, M. K. Narayanan, have separately argued for 'reflection at the highest level' and 'robust discussion' on India's continued adherence to no-first-use.⁶³

Civilian strategic analysts have also argued similarly. As P. R. Chari, a nuclear expert and former head of the MoD think tank, the Institute of Defence Studies and Analyses, argued, shifts in the strategic environment provided 'valid ground to revisit India's nuclear doctrine'.⁶⁴ Such doctrinal arguments were given further impetus in April 2014, when the then principal national opposition party—the BJP—implied in its manifesto that it would revise India's nuclear doctrine. Despite the fact that the government has been in power for a few years and no change has accompanied India's nuclear doctrine, the debate on the need to review India's doctrinal precepts has not died down. In April 2016, a group of

experts again reiterated the need to review some of the basic assumptions guiding India's nuclear doctrine.⁶⁵

The two most salient questions in today's doctrinal debate concern the continued suitability of the no-first-use and 'massive retaliation' pledges in the strategic context that India presently faces.⁶⁶ These precepts were the anchoring elements of Indian nuclear thought in the period immediately following the 1998 nuclear tests, but are now being called into question. These issues will now be explored in the next sub-sections.

THE NO-FIRST-USE DEBATE

That no-first-use has assisted India in projecting itself as a responsible and restrained nuclear power is accepted by most Indian analysts.⁶⁷ Being essentially a defensive policy, no-first-use has helped in 'reassuring globally that India is not an aggressive power'.⁶⁸ This general acceptance of India's responsible nuclear behaviour by the international community has been accompanied by tangible benefits, most evident in the civil-nuclear cooperation agreement with the US. In some sense, India's accommodation into the global nuclear order was facilitated by its nuclear restraint.

However, as critics now argue, the challenges posed by the evolving strategic situation far outweigh the soft power benefits accrued by the 'passivity' of the no-first-use pledge.⁶⁹ First, a no-first-use pledge allows the adversary to carry out 'large scale destruction' even before a 'massive retaliation' can be launched against it.⁷⁰ In the early years of the sub-continent's nuclearisation, the destructive potential of Pakistani strategic assets was curtailed by the range of ballistic missiles and its limited nuclear arsenal. A 'small and symbolic first strike' is easy to absorb: a 'large scale attack', on the other hand, would throw India into 'chaos'.⁷¹ Today, Pakistan claims the ability to target not only the whole of continental India, but also far-off islands in the Andaman Sea. Pakistan's nuclear arsenal is one of the fastest developing in the whole world. In the words of a former Strategic Forces commander, imperilling the populace through a no-first-use pledge is extremely undemocratic, especially when the 'Indian public is not in sync with the government's policy and the nation is not psychologically prepared'.⁷²

Second, although Pakistan has not professed a first strike (pre-emptive strike) option but has only declared a first-use option, decisionmakers in

New Delhi cannot guarantee that in the fog of war such distinctions would remain intact.⁷³ As Gen. Nagal has argued, 'If an adversary is to initiate a nuclear war then it must be such that it concludes on its own terms',⁷⁴ The nature of Pakistan's TNW deployment adds fire to this uncertainty; under the threat of the 'use them or lose them' scenario in case of an Indian armoured assault on the international border, Islamabad may be tempted to not only avail its battlefield nuclear forces, but also to launch an all-out nuclear attack against India. Indeed, under the Indian nuclear doctrine, even adversary use of TNWs would be met with a massive Indian response, leading to unacceptable damage.

Third, a no-first-use policy also restricts India's military options; it cannot attrite the enemy's strategic assets through a selective counter-strike targetting of its nuclear forces. As Chari argues, 'Pakistan is sure that India will not target its TNW's with its own nuclear missiles.'⁷⁵ There is also a moral argument against no-first-use: to deliberately constrain India's military options is both strategically dangerous as it gives the advantage of initiative to the enemy, and 'morally wrong' as 'the leadership has no right to place its population at peril without exhausting other options and only opting for the NFU'.⁷⁶

Pre-emption of Pakistan's use of TNWs is gaining ground among those who advocate a first-use policy; a prominent Indian think tank report had even justified first-use in case Indian decisionmakers acquire credible information on Pakistan preparing for a nuclear attack.⁷⁷ Most recently, former Indian NSA Shivshankar Menon has argued that one 'potential gray area' where India could resort to pre-emption is where New Delhi is 'certain that adversary's launch (of nuclear weapons) was imminent'.⁷⁸ Some analysts have also argued that such pre-emption may be combined with a counter-force targetting strategy where India would seek to demolish Pakistan's nuclear capability to launch a retaliatory strike.⁷⁹ This has fostered a heated debate on whether India is shifting towards a first-use policy; the most likely target is conceived to be Pakistan.⁸⁰ But such pre-emption may not necessarily be through nuclear weapons only. An ex-Strategic Forces commander has argued that India should look forward to employing 'select conventional hardware that tracks and targets nuclear forces', as answers to the strategic situation in the sub-continent 'lay not just in the promise of disproportionate retaliation but also in the credible ability to pre-empt and counter its use'.⁸¹

Fourth, no-first-use has also hardly helped in bridging the trust deficit with Pakistan. Instead, it has only bolstered Pakistan's urge to support terrorism against India, as the former is sure that India will not resort to nuclear use against Islamabad's subversive activities.⁸² As one expert argues, 'This policy (NFU) articulation frees Pakistan of the uncertainty and angst that India might contemplate the pre-emptive use of nuclear weapons to deal with terrorist attacks or limited conventional strikes by Pakistan.'⁸³ Although other concerns regarding the credibility of nuclear first-use against chemical and biological weapons are also often aired in the Indian debate,⁸⁴ the aforementioned arguments form the most common and strategically informed case for revocation of the no-first-use policy.

Critics have advocated adopting a new form of ambiguity around India's nuclear use policy. Maintaining such ambiguity would give India more options to decide at its discretion, stances such as pre-emption, launch on warning, launch on launch, or no-first-use.⁸⁵ It would also certainly undermine the current comfort that Pakistan has with India's existing no-first-use policy.⁸⁶ However, such a move would also likely bring several political and strategic costs for India. Adopting a more assertive nuclear approach towards Pakistan would only escalate its threat perceptions; it will also lead to commensurate developments in Pakistan's conventional and nuclear forces and their positioning along its borders with India. This response could also be seen from China.⁸⁷ Most importantly, as Rajesh Rajagopalan has argued, India does not have the requisite nuclear wherewithal to adopt a first-use counter-force nuclear strategy against Pakistan, since it lacks not only in terms of nuclear warheads, but also delivery systems.⁸⁸ A first-use counter-force strategy would demand immense material, organisational and economic inputs.

More broadly, ending the no-first-use policy could significantly damage India's long-sought international image as a 'responsible nuclear power'. This image is a major foundation upon which India's strategic relationship with the US, its success in obtaining a waiver from NSG sanctions, and prospective permanent membership of the UNSC and NSG, have all been built. A retired Indian Army officer and nuclear expert comments that the present American official perception of India as a 'responsible nuclear power' has been achieved through Indian nuclear policies such as 'the doctrine, the lack of rhetoric, no threats being held out to countries like Pakistan, credible minimum deterrence, no-first-use, no move towards

tactical nuclear weapons'.⁸⁹ These substantial costs would have to be weighed against the above benefits of nuclear flexibility to be gained from ending India's no-first-use policy.

MASSIVE RETALIATION

In the official pronouncement of the nuclear doctrine in 2003, India postulated its retaliatory posture to a nuclear strike as 'massive and designed to inflict unacceptable punishment to the aggressor'.⁹⁰ Although it never used the more commonly used Cold War terminology of 'massive retaliation', in policy analysis, India's retaliation posture was construed to be so.⁹¹ In any case, this was a shift away from the 1999 draft nuclear doctrine, which had depicted India's retaliatory posture as one of 'punitive retaliation'. Jaswant Singh later termed this a posture of 'assured retaliation'.⁹² The shift was palpable because 'massive retaliation' translated into certainty of an ultimate response carrying the entire weight of India's nuclear arsenal; 'punitive' or 'assured' retaliation, on the other hand, had some inbuilt flexibility when it came to the quantum of punishment India would direct towards an adversary for having used nuclear weapons first.

Critics now argue that the 'unrealistic certitude' of massive response suffers from huge credibility problems.⁹³ A retired senior naval officer and nuclear expert argues that 'massive retaliation was a discredited doctrine even during the Cold War'.⁹⁴ The most likely use of nuclear weapons in South Asia pertains to the scenario of Pakistan availing its TNWs against Indian armed forces. Such low-level nuclear use, even when deemed as first-use of nuclear weapons, cannot believably invite 'massive retaliation' from India; as analysts note, it 'defies logic to threaten an adversary with nuclear annihilation to deter use of TNWs'.⁹⁵

An additional but related issue with the doctrine of 'massive retaliation' is that of proportionality of use of force. To threaten the extinction of the enemy, which is inherent in the policy of 'massive retaliation' against low yield, the local use of battlefield nuclear weapons goes against the logic of proportionality of response.⁹⁶ Beyond the credibility-proportionality dilemma, Pakistan's vast nuclear assets likely could not be fully certifiably eliminated, even after a massive strike. This could invite a similar all-out Pakistani nuclear attack upon India. It thus smacks of irrationality for India

to invite unacceptable damage upon itself in response to the adversary use of TNWs.⁹⁷ It is also, as some argue, immoral to endanger the populace with counter-annihilation.⁹⁸

Most important is the issue of political will: would Indian decisionmakers be ready to walk the talk in case the adversary resorts to nuclear first-use? The issue of political resolve is particularly problematic for a policy of 'massive retaliation' because most critics believe that the Indian political class is highly risk-averse. Increasingly, the strategic community is growing sceptical of whether, 'when it comes to the nuclear issue, the political class will have sufficient gumption to ensure assured retaliation'.⁹⁹ This averseness to political risk was manifest in India's response-to-crisis situations in the past, whether it was the Kargil War, the Parliament attack and military mobilisation crisis of 2001–02, or the more recent Mumbai attacks.¹⁰⁰

Given these problems with the doctrine of 'massive retaliation', sceptics have argued for a number of other options. The common thinking behind these options, as described by one analyst, is to 'settle for less than punishing Pakistan "massively" for its temerity to use nukes first'.¹⁰¹ India's response to the breakdown of deterrence must not be informed by objectives of 'revenge seeking' and 'venting rage', as they 'have no place in the decision matrix'.¹⁰² As first propounded by former Indian Chief of Army Staff, K. Sundarji, the idea is to terminate nuclear hostilities at the lowest level, which is possible through direct political intervention. The need, therefore, is to dilute the quantum of punishment in the doctrine into the earlier posture of 'punitive retaliation'. This may provide the Indian decisionmakers the much-needed flexibility to deal with Pakistan's low-level use of battlefield nuclear weapons. If flexibility of response is the solution to various problems arising out of the 'massive retaliation' doctrine, some have argued that 'how India should retaliate to a nuclear first strike' must be left to the 'discretion of the Prime Minister'.¹⁰³

However, even critics of 'massive retaliation' admit that adopting a more flexible retaliatory doctrine at this stage may send out 'wrong signals' to Pakistan and other adversaries.¹⁰⁴ But most importantly, a flexible response posture also does not guarantee India its most important objective: to deter Pakistan's use of nuclear weapons in the first place. India is therefore caught between a rock and a hard place when it comes to its retaliatory posture.

THE GOVERNMENT'S RESPONSE: STAYING THE COURSE.

The responses from the current BJP government (2014–present) and previous United Progressive Alliance (UPA) government (2004–14) to the above arguments have been to reinforce India's existing nuclear doctrine. Just a day after Jaswant Singh had raised the doubts on India's nuclear doctrine in Parliament, the government quickly responded to his criticisms. A government statement held that there was 'no change' in India's nuclear doctrine, and that as far as 'Pakistan increasing nuclear arsenal' was concerned, the Indian government was taking 'effective steps to safeguard India's security and defense interests consistent with our doctrine of credible minimum nuclear deterrent'.¹⁰⁵

Ambassador Shyam Saran also gave a substantial speech on India's nuclear doctrine in April 2013.¹⁰⁶ Although he claimed to have spoken in an individual capacity, the speech was nevertheless widely viewed within India as explaining official views.¹⁰⁷ Saran was the then head of the NSAB, had held various prestigious appointments in the UPA government, and was considered close to the ruling elite. A noted strategic columnist observed that 'Saran was placing on record India's official nuclear posture with the full concurrence of the highest levels of nuclear policy-makers in New Delhi'.¹⁰⁸

This impression was further validated because Saran tried to rebut many of the domestic criticisms which had enveloped India's nuclear doctrine in the last few years; especially those regarding the strategic problem posed by Pakistan's TNWs, and the doubts around the credibility of India's 'massive retaliation' posture. Emphasising 'India's continued insistence on the central tenet of its nuclear doctrine', Saran argued that irrespective of the development of TNWs by Pakistan, India recognises no such labels on nuclear weapons.¹⁰⁹ All nuclear use in the sub-continent would be strategic because any nuclear use by Pakistan—TNWs or otherwise—would be approved at the highest level of political decision-making. India's response, Saran underlined, 'if it is attacked with such weapons', would be 'massive and designed to inflict unacceptable damage on the adversary'.¹¹⁰

At present, the government does not appear to harbour any plans for revision of the doctrine. Despite the inclusion of the pledge to 'revise and update' the doctrine in the BJP 2014 electoral manifesto, after assuming office, Prime Minister Modi moved to rule out any change to the no-

first-use policy soon after the manifesto was released. Modi has instead presented the no-first-use policy and the larger Indian nuclear doctrine as broader expressions of the legacy of former Prime Minister Vajpayee, as well as being symbolic of Indian cultural values dating back to Gandhi and Buddha.¹¹¹

After becoming Prime Minister, Modi repeated his earlier pledge of continuing with India's existing nuclear doctrine. When questioned by Japanese journalists in August 2014 regarding the BJP election manifesto promise of changing the doctrine, he argued that

while every government naturally takes into account the latest assessment of strategic scenarios and makes adjustments as necessary, there is a tradition of national consensus and continuity on such issues. I can tell you that currently, we are not taking any initiative for a review of our nuclear doctrine.¹¹²

The strength of official conservatism regarding the Indian nuclear doctrine is further demonstrated by the BJP ignoring calls by its influential Hindu nationalist ideological partner, the Rashtriya Swayamsevak Sangh (RSS), to revise the doctrine.¹¹³

Notwithstanding the government's response, what is beyond question is the firmament enveloping the Indian thinking on its nuclear doctrine, at least at the level of intellectual debate and discussion among its foreign policy and strategic elites. These doctrinal debates, conducted within India's nuclear strategic discourse, coincide with a greater focus on operationalisation, diversification, and continued expansion of the nuclear force within the Indian government. While the 2013 Saran speech reiterated India's traditional stance towards TNWs, and the incoming BJP government of 2014 reversed its manifesto pledge regarding revision of the nuclear doctrine, there is still a robust debate being conducted inside and outside the Indian government regarding the relevance of the 2003 doctrine in relation to the nuclear forces India is developing and the environment it faces today. The rising tension between the strong support for 'minimum' deterrence and the growing pressure to demonstrate 'credible' deterrence has reached such a point that NSA Ajit Doval, speaking in October 2014, referred only to 'credible' deterrence in describing India's future posturing intentions.¹¹⁴ While it is still too soon to tell if this formulation signifies, as one Indian analyst has claimed,

whether 'India is shifting its posture from credible minimum deterrence to credible deterrence', it at least highlights the existence of the substantial interest in emphasising the 'credible' over the 'minimum' in India's current nuclear debate.¹¹⁵

CONCLUSION

In spite of the current firmament and debate over the nuclear doctrine, the remarkable continuity which underlines India's doctrinal journey since it tested nuclear weapons in May 1998 is indeed perplexing. More so because the doctrine has tolerated the pressure of the changing security environment, organisational impulses within the military, technological sophistication of its arsenal, growing discontent among the strategic elites on the existing doctrine, but also the change of government at the centre. In fact, three different Prime Ministers have affirmed the same doctrinal principles over a period of 20 years.¹¹⁶ Changes did accompany India's nuclear doctrine, as was the case in the dilution of the no-first-use pledge and the shift from 'punitive retaliation' to 'massive retaliation' in 2003. But the basic philosophy underlying India's nuclear doctrine has remained the same. These are: first, that nuclear weapons are political instruments to deter nuclear blackmail and their use, rather than tools of warfighting; second, that India's national interests are best served by a policy of 'no-first-use' of nuclear weapons; and finally, that India would adopt a purely 'retaliatory' nuclear strategy even when it suffers heavily from the first-use of nuclear weapons against it.

Although it is hard to pinpoint precisely the reasons behind such continuity, it is evident from the arguments presented by the votaries of the current nuclear doctrine that changes in no-first-use and 'massive retaliation' may not help in answering the problems which currently confront New Delhi. Inserting purposeful ambiguity in India's nuclear use policy may drive India towards an arms race, but it would also force a more ready nuclear arsenal entailing hair trigger alerts and launch on warning postures, a scenario which does not brook much favour among India's political class.¹¹⁷ Moving away from an assured retaliation posture to graduated use would also entail nuclear warfighting—a futile exercise. As one retired diplomat has argued, 'controlled nuclear war between India and Pakistan is impossible'.¹¹⁸ This would also lead to a fundamental

reorientation in India's views on nuclear weapons: from being 'political tools' for ensuring deterrence to 'military instruments' of warfighting.¹¹⁹ But there may also be some other reasons for such doctrinal conservatism.

First, as was outlined in Chapter 4, an outline of a basic nuclear doctrine was already in place by the time India decided to test in May 1998. During the formative years of the Cold War, Indian decisionmakers had indeed contemplated various patterns of nuclear deterrence, and had convulsed around a doctrine which emphasised the purely deterrent character of nuclear weapons vis-à-vis their warfighting utility. Therefore, no-first-use was an integral element of India's nuclear thinking developed during the Cold War years. Second, the historical origins of Indian nuclear thought also points to a minimalistic orientation as far as the size of the Indian arsenal was concerned. In fact, both of these elements were an integral part of India's institutional responses to questions of nuclear deterrence, demonstrated in the conclusions of various committees formed between 1985 and 1998 over the nuclear question. Continuity in doctrinal thinking can therefore be located in the institutional memory of India's nuclear deterrence.

Third, Indian strategic decision-making suffers from a lack of strategic planning. Decisions are not made until absolutely necessary. Strategic planning is always at a premium in a polity where immediate concerns are always more pressing, and require the time and attention of the political class much more than vague requirements of strategy. The need for doctrine post-1998 was a necessity born out of the reality of the nuclear tests; and India, as the historical record explained in the earlier sections of this chapter suggests, undertook the process only grudgingly. It took India approximately five years to enunciate its nuclear doctrine officially. The strategic defence review never accompanied the official nuclear doctrine, even when, in the order of priority of the then BJP-led NDA government, it came first. Such a trend is also visible in issues concerning national security per se. Although a number of high level committees on national security—the Kargil Review Committee 1999, the Group of Ministers Report 2001, the Satish Chandra Committee 2011—have submitted their findings to the government, changes have been hard to come by, and those that have happened have been only cosmetic.¹²⁰

Fourth, there is the perennial problem of India's unique structure of civil-military relations. The civilian bureaucracy dominated by the Indian Administrative Service has continuously acted as the only gatekeeper when

it comes to interaction between the political class and the military.¹²¹ The military's concerns are always filtered through the bureaucratic lens: some have argued that rather than civilian control, India's military suffers from excessive 'bureaucratic control'. In such a situation, the military's viewpoints on strategy are always at a premium. The fact that many of the military officers who have suffered in the SFC are currently critiquing India's nuclear doctrine points to their own sense of frustration with nuclear decision-making structures when they were in office.¹²²

The doctrinal evolution is also conditioned by India's external environment. Isomorphic pressures from major nuclear powers, especially from the US, have indeed induced change in India's doctrinal policy.¹²³ For a start, post-1998, US pressure was critical to India enunciating a doctrine in the first place. The criticisms of Strobe Talbott of the 1999 DND and Jaswant's course correction in his November 1999 interview point in the same direction. Some have argued that the conditioning of the no-first-use on chemical and biological weapons in 2003 was influenced by the 2002 nuclear posture review of the US.¹²⁴ India's changing policy of missile defence, however, is the most concrete evidence in this regard. As Ashley J. Tellis has shown, India's policy in 2002–03 was a complete mirror image of its traditional policy on the idea of missile defences. Although this was not reflected in the 2003 doctrine, later in the year, New Delhi had formally announced to the US its intentions to incorporate missile defence in nuclear posture, and by implication, in its nuclear doctrine.

However, one of the most important, yet under-mentioned, factors is that many in India continue to view its nuclear doctrine as a statement of its unique nuclear philosophy: one which underlines 'responsibility' and 'restraint' as the basic guiding principles, not only of its nuclear behaviour, but also its historical world view.¹²⁵ This has also helped India to make inroads into the global nuclear regime, evident in its unique status 'as a responsible state with advanced nuclear technology'—the closest to the status of a recognised NWS under the NPT as a non-NPT member can get. India has achieved this through the Indo-US nuclear deal.¹²⁶ The doctrine therefore is not just a military statement; it is also a pitch for Indian foreign policy: nuclear weapons 'impose immense responsibility and demand prudence and sobriety in how we conduct ourselves in the community of nations'.¹²⁷

In order to ensure that this tradition of restraint remains entrenched within Indian nuclear thought, however, an official defence review is

required. More so, because doctrines are evolutionary concepts and depend upon threat perceptions and security objectives; and therefore, if the need arises, they should be subject to change. Such policy decisions need the meticulous weighing of various options. With developments in Pakistan and Chinese nuclear strategies, and with India's increasing technical capabilities, Indian nuclear planners are approaching a decision point, with a response required to the following question: How does India intend to strike a balance between the continued substantial support for 'minimum deterrence' (including the international diplomatic advantages accrued by a 'responsible minimum deterrence' doctrine) and the above pressures, as generated by India's worsening strategic environment and the growing sophistication of its technical nuclear capabilities, to elevate the role of nuclear weapons in Indian defence? This question can only be settled through an official strategic defence review.

As is becoming increasingly clear, proceeding on the current trajectory without conducting such a review risks even greater doctrinal and posturing incohesion; as we have seen, the 2003 nuclear doctrine, statements of defence scientists, actual force capabilities being planned and fielded, and remarks by the NSA already partly contradict each other at times. A review would provide a public assessment of: the threats facing India; how India can best employ and develop conventional and nuclear forces to deter these threats; and a clear understanding that nuclear forces attain relevance only in situations where national survival is at risk. Thus, an official defence review would provide a better articulation of India's nuclear doctrine and posture, and the relationship of India's nuclear forces to its broader defence projection in 2018, in the world it faces in 2018, than is available at present.

India's non-proliferation policy approaches are also relevant to its profile as a regional and global nuclear actor in the twenty-first century, and we will now turn to explore these in detail.

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Indian Non-Proliferation Policy

Approaches and Challenges in the Twenty-first Century

If India's nuclear force structure and its ideological position on nuclear deterrence constitute the first and second pillars of its nuclear policy, its approach to questions of nuclear non-proliferation and arms control forms the third. This chapter provides an analysis of India's evolving behaviour on the issues of nuclear non-proliferation and arms control since 1998, the year India declared herself as an NWS, following a series of nuclear tests at Pokhran. This chapter has been divided into three sections. The first section deals with issues of non-proliferation and India's policies on mechanisms such as the NPT and the NSG. The second section focuses on India's policies on arms control measures such as the CTBT and the FMCT. The last section dwells upon India's reactions to state-specific nuclear challenges posed by countries like Iran and North Korea.

This chapter will argue that India has demonstrated substantial commitment to curtailing global proliferation. However, its method of developing and implementing non-proliferation policies has often been conducted willingly, independent of principal structures for global non-proliferation policymaking, such as the NPT, CTBT, NSG and FMCT processes. India's overall approach has tended to involve extensive actions to address external proliferation, so long as these do not threaten important national interests. This perspective looks set to continue to characterise Indian non-proliferation policymaking; it helps explain many of the idiosyncrasies in India's history of engagement with the above international regimes, and in the execution of its policies to limit proliferation.

INDIA, THE NPT AND NSG

Until the 1998 nuclear tests, India remained a perennial outlier to the international nuclear non-proliferation regime. It had actively engaged in the negotiations leading to the NPT in the Eighteen Nation Committee on Disarmament (ENCD) during the mid-1960s. However, as the treaty took shape, India declined to be a part of this global mechanism to combat nuclear proliferation. India's reservations obtained from two features of the treaty. First, it legitimised nuclear weapons of the existing nuclear powers by bestowing upon them the privileges of an NWS on an arbitrary timeline: all states that had exploded nuclear devices before 1 January 1968, according to the treaty, could continue with their nuclear weapons programme. This included China, too. For India, this amounted to nuclear apartheid, since New Delhi had the requisite expertise to go nuclear, but had conscientiously decided to remain non-nuclear. Second, the NPT had failed to provide any explicit security guarantees against the nuclear threat from China. Hedging against the Chinese threat therefore required India to keep its nuclear option open, in case of security requirements in the future.¹

New Delhi's refusal to be a signatory to the NPT in the late 1960s initiated India's long, yet difficult relationship with the non-proliferation regime.² In fact, from being an initial architect of the non-proliferation regime, it later became one of its principal targets. As India conducted a peaceful nuclear explosion (PNE) in 1974, a cartel of major technologically developed states combined their efforts to deny India the requisite technology for its civilian nuclear programme, lest such assistance be diverted to a weapons programme.³ This resulted in the formation of the NSG.⁴ Under its guidelines, India's civilian nuclear programme came under heavy sanctions. Such denial of technology crippled India's civilian nuclear programme, most visible in the American refusal to supply India with enriched Uranium fuel for its Tarapur nuclear plant in the late 1970s and early 1980s.⁵

Such sanctions, however, were not limited to India's nuclear programme; as India slowly trudged up the path of developing a weapons capability, including ballistic missiles, in the late 1980s, its entire strategic programme was targetted. For New Delhi, the MTCR, established in 1988, was yet again a manifestation of the non-proliferation regime's continuous targetting of India's capabilities and strategic autonomy.⁶

With the end of the Cold War, nuclear non-proliferation acquired significant momentum. The global balance of power tilted towards the US, which perceived nuclear non-proliferation as one of the most important issues in post-Cold War global politics. This period immediately after the Cold War, in the words of William Walker, was one of 'nuclear enlightenment': many states such as South Africa, Ukraine and Belarus gave up their nuclear weapons, the NPT was indefinitely extended in 1995, and serious negotiations began on a CTBT.⁷ These developments translated into increasing international pressure on India to formally join international non-proliferation policy structures and give up its military nuclear option.

Within India, however, these developments forced policymakers towards a defiant posture.⁸ The 1998 Indian nuclear weapons tests released some of this pressure that had gradually accumulated upon India due to its ambiguous nuclear policy and its difficult relationship with the non-proliferation regime in its first three decades.⁹ As C. Raja Mohan has observed, within a decade of the 1998 nuclear tests, India obtained *de facto* recognition as an NWS, with the successful conclusion of the India-US civilian nuclear agreement in 2008.¹⁰ It was recognised as a 'state with advanced nuclear technology', and the technological barriers emanating out of India's difficult relationship with the non-proliferation regime were also removed.¹¹ The NSG, originally conceived to target India's nuclear programme, now unanimously granted an exemption to New Delhi to trade in sensitive nuclear technologies and materials.

This turnaround in India's fortunes may have been a result of two important strategic developments between 1998 and 2008.¹² First, India's economic rise with high growth rates provided a geo-economic heft hitherto enjoyed by Indian diplomacy. India's economic rise not only allowed her a bigger diplomatic space but also provided her with greater bargaining power. Accommodation of this rising power therefore fitted well with historical trends in international politics where established powers have often accommodated rising powers. China's accommodation by the US in 1980s and 1990s was inspired by this logic. By the first decade of the 21st century, India was an equally strong candidate. The Indo-US nuclear deal was partly motivated by the need to accommodate India in the global nuclear order. Second, despite its position as the chief architect and enforcer of the non-proliferation regime, India was a natural partner

to the US in checking the strategic rise of China as Washington's most probable future challenger.

However, these strategic reasons for Indian accommodation were complemented by India's non-proliferation policy approaches during this time frame. Even though a perennial outlier to the non-proliferation regime, two facets of India's non-proliferation policy had been well entrenched by the time it conducted its nuclear tests in 1998. For one, even when India constantly argued against the NPT, it maintained its support to the general principle of non-proliferation. India's major argument was not against horizontal proliferation; rather, its complaints pertained to the lack of attention and focus on vertical proliferation within the NPT. Simply put, the goal of non-proliferation was not fundamentally against India's interest; its selective application was. The difference between India's support for the principle of non-proliferation and its resistance to the NPT is well-documented in its 1995 Annual Defence Report: 'India makes a distinction between the NPT and non-proliferation. While maintaining reservations on the former, India is fully committed to the goal of curbing nuclear proliferation.'¹³

Second, New Delhi had followed an export control policy of refusing nuclear technology commerce where there could be a potential proliferation hazard. In the aftermath of the PNE in 1974, New Delhi had promised the US that it would not export Indian nuclear technology to states with possible proliferation concerns.¹⁴ Such export control policy was maintained throughout the turmoil-filled years of India's conflicted relationship with the non-proliferation regime. Even when India consistently argued against technology denial regimes imposed by the developed countries, it strived to align its own export control policies with global standards.¹⁵ Prime Minister Vajpayee declared to the world in the aftermath of the nuclear tests: '... our strengthened capability (of nuclear weapons) adds to our sense of responsibility and obligation of power.'¹⁶ Such responsibility would translate into a modest nuclear arsenal; a highly limited nuclear doctrine; and several arms control measures, such as the unilateral moratorium on nuclear testing and a willingness to negotiate an FMCT and CTBT. The Indian government also suggested that although India was not a party to the NPT or a member of the NSG, it was 'committed to non-proliferation and maintaining of stringent export controls', to ensure that indigenous know-how and technology is not clandestinely leaked.¹⁷

Immediately after the 1998 nuclear tests, the UNSC had called upon India and Pakistan to join the NPT through the issuance of UNSC Resolution 1172. While rejecting this demand, New Delhi still somewhat moderated its position on the NPT in the post-1998 period.¹⁸ In the middle of the 2000 NPT Review Conference (RevCon), India's External Affairs Minister Jaswant Singh issued a *Suo Motu* statement in Parliament, claiming that '... though not a party, India's policies have been consistent with key provisions of NPT that apply to nuclear weapon states'.¹⁹ This was indeed an interesting formulation, as the obligations India claimed to be adhering to under the NPT were those of 'nuclear weapon states'. These obligations largely translated to Articles 1 and 3 of the treaty, which restricted NWS from supplying nuclear technology and material to non-nuclear-weapon states (NNWS) for purposes other than peaceful uses of atomic energy. As External Affairs Minister Jaswant Singh stated in Parliament, 'One of the basic obligations of nuclear weapons states under the NPT was to prevent further proliferation.'²⁰ On one level, India's obligations could be read as political convenience: having gone nuclear, India was now much more comfortable espousing the rationale behind the NPT. However, this was also consistent with its approach of supporting non-proliferation principles on the one hand, while boycotting the inherent divisions created by the NPT on the other.²¹

Supporting the non-proliferation principle was also a strategy to help India's accommodation in the non-proliferation regime. Immediately after the 1998 tests, the Indian government initiated a nuclear dialogue with the US. It was aimed at a revocation of the economic sanctions imposed by the US in response to the nuclear tests, but also to find a *modus vivendi* to reconcile the reality of India's nuclear weapons programme with the larger non-proliferation regime.

Among the very first concessions that India offered to its American interlocutors during this dialogue was export controls: it promised to enact strict export control laws commensurate with international standards. By early 1999, a group on Strategic Export Controls was set up to 'review the implementation of the existing system and make recommendations to increase effectiveness'. By 2000, India's Director General of Foreign Trade had enacted a list of Special Chemicals, Organisms, Materials, Equipment and Technologies (SCOMET), further tightening India's export control policy.²²

The real breakthrough, however, occurred with the enactment of the Weapons of Mass Destruction and their Delivery Systems (Prevention

of Unlawful Activities) Act, also known as the WMD Act, by the Indian Parliament, in June 2005. This legislation was part of India's commitment to the UNSC Resolution 1540. Adopted in April 2004, the resolution mandated that all states 'take and enforce effective measures to establish domestic controls to prevent the proliferation of nuclear, chemical, or biological weapons and their means of delivery'.²³ India had actively participated in the negotiations leading up to the adoption of the UNSC 1540. Since its adoption, India has also used the guidelines issued by the 1540 committee in submitting its national reports on export controls to the UNSC.²⁴

These shifts in India's non-proliferation policy did indeed help its quest for accommodation in the international nuclear order. When US President George W. Bush declared in June 2005 that 'as a responsible state with advanced nuclear technology, India should acquire the same benefits and advantages as other states', India's track record on nuclear non-proliferation was held to be one of the benchmarks of its responsible nature.²⁵ As US Undersecretary of State R. Nicholas Burns argued in June 2005,

India has a record of nonproliferation, which is exceptional; ... And what was significant about yesterday's agreement is that India committed itself in public, very specifically to a series of actions to which it had not previously committed itself. Actions, which will, in effect, in a de facto sense, have India agreeing to the same measures that most of the NPT states have agreed to.²⁶

For three long years beginning in 2005, India and the US negotiated India's accommodation in the nuclear non-proliferation regime.²⁷ India agreed to structurally separate its nuclear weapons programme from its civilian nuclear energy programme, sign an IAEA Additional Protocol, and give guarantees to continue its nuclear test moratorium and negotiate on the FMCT. The US, for its own part, changed its domestic nuclear laws to restart the nuclear technology trade with India, and also promised to secure India an exemption from NSG nuclear technology export restrictions. In September 2008, the NSG unanimously agreed to permit India to engage in nuclear trade. In October, the civilian nuclear deal was finally approved by President Bush.

The NSG waiver was a historic landmark in India's relations with the non-proliferation regime. As Indian Prime Minister Manmohan Singh

argued, '... (the waiver) marks the end of India's decades-long isolation from the nuclear mainstream and of the technology denial regime.' However, the civilian nuclear agreement with the US constitutes only a partial accommodation for India in the nuclear non-proliferation regime. Under the NPT system, India is still considered a nuclear outlier; it is also not a member of any of the major technology denial regimes, such as the NSG, MTCR or the Australia Group. Post-2008, the debate within India has veered towards gaining full accommodation in the international nuclear order. Two issues have gained maximum attention: India's joining the NPT as an NWS and India's membership of the NSG.

The debate on India's permanent membership of the NPT as an NWS reached its crescendo just before the NPT Review Conference in 2010. In an interview to Fareed Zakaria on CNN, Prime Minister Singh had argued that India was a 'nuclear weapons state, but we are a responsible nuclear power'. This was widely interpreted as a call for the formal inclusion of India within the NPT as an NWS. As Sumit Ganguly and David P. Fidler argued at the time, 'Singh's statement represents the first public announcement by a high-ranking official that India wants to be a NWS within the NPT. Indian press reports indicate that Singh is serious about this proposal, despite opposition within India.'²⁸ The arguments presented in favour of India's candidacy ranged from its being a responsible nuclear power to the idea that India's inclusion in the treaty would ultimately help in strengthening the non-proliferation regime.²⁹ Some have even argued that reforming the NPT to include a third category of states—advanced states with nuclear technological capability—could be the possible way to include India in the treaty.³⁰

However, following the recommendations made by the 2010 NPT RevCon, this debate soon died down. For the first time in its history, the RevCon explicitly called upon the non-NPT states (India, Israel and Pakistan) to join the NPT as NNWS.³¹ The final declaration also reaffirmed that the majority of the states did not accept India as an NWS, as was the expectation after the Indo-US nuclear deal. This debate in the strategic community pointed towards a long-held aspiration among the Indian elites: the prestige and legitimacy of being an NWS within the NPT.³² Although this aspiration has remained subdued due to adverse reactions among the NNWS, it is the ideal that New Delhi wants to attain. However, for the time being, the best possible option for India is to maintain the status quo.³³

Since securing the NSG exemption in September 2008, India has subsequently sought admission to the NSG as a full member, alongside pursuing membership of the MTCR, Australia Group and Wassenaar Arrangement groupings regulating the export of missile, chemical/biological, and sensitive conventional technologies, respectively. For India's strategic community, winning admission to the Nuclear NSG in particular will strengthen its claims to be seen as a 'responsible' nuclear weapons state and to join that most exclusive state grouping, permanent membership of the UNSC.³⁴

India regularly engages the leading states of the NSG to argue its case for admission.³⁵ President Obama endorsed India's candidature for NSG membership while visiting India in 2010. The US introduced a 'food for thought' paper in 2011 on NSG deliberations regarding potential Indian membership, suggesting that the group could waive the normal NPT membership criterion for India. Britain issued a similar paper in 2013.³⁶ Along with that of the US, India has also won the support of Australia, France, Germany, Russia, South Korea and the UK. However, India's NSG challenges still remain substantial.³⁷

NSG membership is agreed upon by group consensus, and India's diplomacy has not yet been able to overcome the continuing opposition by several members, including Ireland, Japan, the Netherlands and Switzerland. India is unwilling to yield to demands for stronger non-proliferation commitments, which could include adopting a permanent test ban or ending fissile material production.³⁸ Given that the Indian 'package' of non-proliferation commitments is substantially the same as it was for securing an NSG sanctions waiver in 2008, the situation is therefore today at an impasse.³⁹ However, notwithstanding the impasse on non-proliferation commitments, the biggest obstacle to India's NSG membership is China.⁴⁰

Unlike other major powers, China has not been particularly enthusiastic about accepting India as an NWS. China viewed the Indo-US nuclear deal with hostility: as an attempt by the US to prop up India as a challenger to China's hegemony in Asia. Also, by granting a de facto nuclear status to India, the nuclear deal placed the two Asian rivals on the same pedestal. It is not without reason, therefore, that Beijing left no stone unturned to block the consensus in the NSG when, in 2008, the issue of an India-specific waiver came up for discussion.⁴¹ China's strategy to effectively sabotage India's NSG membership is by advocating a *quid pro*

quo for Pakistan. Given Islamabad's past problems with proliferation, that is, the A. Q. Khan Network, such a proposal has hardly any takers in the NSG. Its strategic merit, however, lies somewhere else: by linking India's membership with Pakistan, it not only invokes the fear of a crumbling nuclear regime under the weight of the exceptions being granted to India, as many committed non-proliferationists argue, but it also takes care of China's all-weather friendship with Pakistan. Moreover, China's resistance to India's membership in the NSG is symptomatic of the rivalry among the rising powers in other global institutions, such as the UNSC.

With Narendra Modi becoming the Prime Minister, some positive movement on India's membership bid has followed. The new government was able to garner support from South Korea when Modi visited Seoul in 2015.⁴² Given that the US remains the pre-eminent global power, its support is critical for India's candidature. However, seven years into the Indo-US nuclear deal, India has not been able to make a break-through. This has led to some palpable frustration in New Delhi; as an Indian expert observes, '... the fact that this has lingered on for so many years doesn't speak well of either side in terms of fulfilling their commitments and obligations.'⁴³ Washington has in principle accepted the fact that India's membership in the NSG and other export control regimes would 'strengthen global nonproliferation and export control regimes', as was evident from the text of the Joint Declaration issued by the two sides when President Obama visited India in January 2015.⁴⁴ This joint statement also indicated that the US agrees to the fact that 'India meets MTCR requirements and is ready for NSG membership', and 'that it supports India's early application and eventual membership in all four regimes'.⁴⁵ Concerted efforts from both sides allowed India to gain membership of the MTCR in June 2016.⁴⁶ The fact that China is not a member of the MTCR definitely helped India's cause. However, for India's NSG quest, the two countries will have to push much harder.

This section has highlighted India's willingness to implement non-proliferation policies independent of the formal NPT and NSG structures, while also seeking alignment with their export control standards insofar as these do not compel the sacrifice of core perceived Indian interests, including, most visibly, India's right to a nuclear weapons capability. The outcomes of this underlying Indian approach will be further highlighted in the next section, which explores Indian perceptions of the CTBT and FMCT.

INDIAN APPROACHES TOWARDS THE CTBT AND FMCT

The two major issues in arms control which have huge consequences for India's nuclear policy are its attitude towards the CTBT and the FMCT. Just like the non-proliferation regime, India's relationship with these two arms control measures has a highly chequered history. In August 1993, India had played a constructive role in the decision to initiate negotiations on an Ad Hoc Committee on nuclear test ban at the Conference on Disarmament (CD) in Geneva.⁴⁷ India was one of the firm supporters of a test ban treaty in the early 1990s. Similarly, India played a pivotal role in leading the negotiations on FMCT: in December 1993, New Delhi had co-sponsored, with the US, a Canadian resolution in the United Nations General Assembly (UNGA), calling upon the CD to initiate negotiations on a treaty banning further production of fissile material for weapons purposes.⁴⁸ Such initial leadership, however, did not translate into India's final sponsorship of such arms control measures. In 1996, India declined to sign the CTBT on the pretext that the treaty did not sufficiently address its national security interests.⁴⁹ Since the adoption of the Shannon mandate by the CD in 1995, FMCT progress has remained logjammed due to the reservations of the G-21 states (including India) against including existing stocks of fissile material within the purview of the treaty.⁵⁰ India had supported this interpretation between 1995 and 1998.⁵¹

However, the nuclear weapons tests of 1998 paved the way for a qualitative shift in India's posture on both of these arms control measures. Soon after, India declared a unilateral moratorium on further nuclear testing. During the initial phase of the Indo-US nuclear dialogue, New Delhi also showed an interest in signing the CTBT. In September 1998, Prime Minister Vajpayee declared at the UN that India was now looking forward to signing the CTBT:

(India) having harmonized its national imperatives and security obligations and desirous of continuing to cooperate with the international community is now engaged in discussions with key interlocutors on a range of issues including the CTBT. We are prepared to bring these discussions to a successful conclusion, so that the entry into force of the CTBT is not delayed beyond September 1999.⁵²

This was indeed a significant statement highlighting the change in India's national position and the more positive disposition of the Indian government towards the treaty after the 1998 tests. A number of reasons explained India's volte-face. First, India had achieved its primary security interests by exploding a series of nuclear devices. The weaponisation of India's nuclear deterrent could therefore proceed satisfactorily. Second, a positive approach towards the CTBT could also help New Delhi end its diplomatic isolation from the international community. Last, the US had preconditioned a normalisation of relations and revocation of economic sanctions on India's adherence to the CTBT. All these factors contributed to the change in policy. However, much before negotiations could achieve any desired results, the US Senate rejected the CTBT in October 1999. The effect of the Senate's verdict on India's behaviour was palpable: as India's External Affairs Minister Jaswant Singh argued later, the 'Senate vote was like a pressure valve for India, too suddenly, the sting from US efforts (to force India's signatures to the CTBT) was gone'.⁵³

At this time, Prime Minister Vajpayee was indeed facing a lot of domestic pressure against signing the CTBT. If the political opposition was united against what it construed as compromises to Indian security and the government's willingness to prostrate before the US, the Indian military establishment was also not convinced of the strategic logic of the test ban. In early 1999, the Chiefs of Staff Committee (COSC) had advised the government against signing the CTBT. Interviews with one of the members of the COSC during this time reflect uneasiness within the military regarding the technical success of the 1998 nuclear weapons tests, especially of the hydrogen bomb.⁵⁴ The military, it appears, was sceptical of the yields produced by the hydrogen device tested in 1998. There was some controversy regarding the yields of the tests, with many foreign scientists challenging the claims made by the Indian nuclear establishment.⁵⁵ The government, however, had sided steadfastly with the estimates of the Indian nuclear scientific enclave.

Both Indian domestic opposition to and American rejection of the treaty had contributed to India's decision to not sign the CTBT. India continued with its voluntary moratorium on nuclear testing. In September 2000, during the 55th session of the UNGA, Prime Minister Vajpayee indefinitely extended India's voluntary moratorium.⁵⁶ The Indo-US nuclear deal further formalised India's unilateral moratorium. Under the

treaty, additional nuclear tests by New Delhi could lead to a revocation of the agreement.

Many commentators have argued that by acquiescing to an indefinite testing moratorium as a *quid pro quo* to the nuclear deal, India has given up its autonomy to conduct nuclear tests. The most significant criticism of India's voluntary moratorium emanates from the controversy regarding the yield of the 1998 test. Doubts around the 1998 nuclear tests have been rekindled by testimonies of some senior nuclear scientists. In August 2009, K. Santhanam, project director of the 1998 tests, publicly declared that the thermonuclear device was a 'fizzle', or that it had unexpectedly underperformed compared to its planned yield.⁵⁷ This sparked a fierce public debate, fuelled by Santhanam's claim that he had broken his silence only because the Obama administration had pressed New Delhi to sign the CTBT.⁵⁸ Despite the assurances provided by Prime Minister Singh and senior Indian scientists, concerns about weapons reliability have made New Delhi more reluctant to publicly discuss India's future approach to the treaty.⁵⁹

This controversy continues to inform the debate on India's nuclear posture and its deterrence capability in a number of ways. First, if in future India decides to set limits to its nuclear programme, warhead yields would be a major determinant. The controversy around the 1998 thermonuclear test persists, and there is still substantial domestic opposition to the CTBT. Second, new delivery systems such as the SLBMs would require further miniaturisation of nuclear warheads.⁶⁰ In the face of such technological challenge and the reported failure of the thermonuclear device tested in 1998, India may not find it attractive to surrender its option to test. Last, the confidence of the military in India's warhead capabilities would be equally consequential. As a retired admiral has argued, 'There is a unanimous agreement outside the AEC-DRDO circles that India will not be able to build safe and reliable two-stage fusion weapons on the basis of single 1998 test, since the fusion stage of the test was only a partial success.'⁶¹ As the end-user of India's nuclear capability, the confidence of the military in warhead yields is an important factor which has not received enough attention in the discourse over India's attitude to the CTBT.

As was underlined earlier, in the period immediately after the 1998 tests, the armed forces had argued against signing the CTBT. If a political decision is made to sign the CTBT, India would have to rely mostly on

boosted fission weapons (a nuclear bomb that requires a small amount of fuel to generate greater yield).⁶² This may compel India to address the question of what it would technically consider 'massive retaliation', as mandated by its nuclear doctrine.⁶³ There are no easy answers to these questions, but they point to an important debate that must be resolved before India can decide on signing the CTBT.

As has been the case with the CTBT, India's position on the FMCT, in the post-1998 period, has seen a positive change. After the 1998 nuclear tests, the Vajpayee government indicated its willingness to negotiate an early conclusion of the FMCT.⁶⁴ Similar assurances were provided to the US during the Indo-US dialogue.⁶⁵ Consequently, when in August 1998 the CD finally agreed to establish an Ad Hoc Committee to negotiate the FMCT, India dropped both of the conditions on which it had earlier opposed the treaty, thereby bringing its position in harmony with other NWS.⁶⁶ In September 1998, the Vajpayee government declared in the CD that 'such a treaty will not eliminate existing arsenals'. The reference to a time-bound framework for disarmament was also dropped.⁶⁷ Following this, in 1999, India dropped its reservation on effective, multilateral and intrusive verification mechanisms under the FMCT, which it had earlier insisted upon.⁶⁸ Therefore, by the end of 2000, India's position on the FMCT was aligned to that of the US.

These changes were also evident during the negotiations on the Indo-US civilian nuclear agreement. As a *quid pro quo* to the easing of US restrictions on nuclear trade, India committed itself to 'working with the United States for the conclusion of a multilateral Fissile Material Cut-off Treaty'.⁶⁹ However, unlike other P-5 countries, with the exception of China, India had declined to observe a unilateral moratorium on further production of fissile material.⁷⁰ The change in India's orientation towards the FMCT has hardly borne any positive results in the CD. In June 2009, the CD unanimously agreed to pursue the FMCT after 16 years of dilly-dallying. Since then, Pakistan has consistently blocked all resolutions on the treaty. Pakistan's principal opposition is on the issue of stocks of fissile material, which the treaty in its present form does not address. According to Islamabad, a treaty that does not lead to the verifiable elimination of fissile material stocks and is only concerned with stopping future production of nuclear material is inherently discriminatory, does not serve the purpose of global nuclear disarmament, and most important, from Pakistan's perspective, renders the strategic balance in the South Asian

region in favour of its archrival, India.⁷¹ For one, India possesses huge stocks of RgPu.⁷² Second, the Indo-US nuclear deal has allowed India to further enhance its fissile material stocks by diverting its indigenous production of natural uranium to its weapons programme.⁷³

As in the case of the CTBT, the issue of the FMCT is intricately linked with India's deterrence posture.⁷⁴ The critical factor in India's future policy on the FMCT would be defined by its deterrence requirements: how much fissile material would be needed to assure a credible deterrent posture? These questions cannot be resolved easily. While some minimalists in India's strategic community have argued for a total of around 100 nuclear warheads to provide India with sufficient capability, some maximalists have argued for a force strength of over 400 weapons.⁷⁵

The policy of 'credible minimum deterrence' is also undergoing a shift. Sophisticated weapon systems and increase in delivery vehicles would automatically generate pressure to increase the number of warheads.⁷⁶ For example, a fleet of six ballistic missile submarines with a capacity of 12 to 16 SLBMs would themselves require around 100 warheads. India is also now experimenting with MIRV technology. Such technological determinism would automatically increase the pressure for more fissile material. However, the changes in India's nuclear doctrine are also crucial determinants. If India gives up its no-first-use policy and adopts a retaliatory posture of flexible response over that of 'massive retaliation', one can foresee an increase in the size of India's nuclear arsenal. All these factors would determine the future trajectory of India's policies on the FMCT.

This section has illustrated the importance of the overarching perceived Indian national interests—including, principally, the need to build and maintain a nuclear force of sufficient size and reliability to provide an adequate deterrent—in conditioning the degree of Indian willingness to fully join the CTBT structure and FMCT processes. While India still practices non-proliferation policies aligned to the intentions of these regimes—a unilateral testing moratorium and regular formal participation in FMCT dialogues at the CD—the degree to which Indian non-proliferation policy is determined by prior broader Indian strategic interests is becoming increasingly clear. Having examined Indian approaches towards regime-specific non-proliferation structures, the next section will identify how this tendency is also visible in Indian responses towards state-specific non-proliferation challenges.

STATE-SPECIFIC NON-PROLIFERATION CHALLENGES:

Iran

India's policies towards state-specific nuclear non-proliferation issues—in recent years, those involving Iran, North Korea and Syria—highlight the same conceptual approach as its policy towards structures of the non-proliferation regime. This features a genuine interest in preventing nuclear proliferation. However, this interest is conditioned and limited by perceived overarching Indian imperatives. These include: a multifaceted view of India's relationship with the state in question, in which the nuclear issue is but one of many interactions of the state with India; India's shared membership of the Non-Aligned Movement (NAM) with each of the states in question, which has further moderated India's stance towards them; and, underpinning this, deep-rooted preferences in Indian policymaking for dialogue over force to solve these kinds of issues.

While India works with other states to pressure the state in question to resolve the nuclear issue, the manner in which it does so reflects the above tendencies. India's behaviour has remained relatively constant since 1998, with little in the way of transitions to new approaches, as seen elsewhere in this study. India is likely to continue its present policy of advocating peaceful diplomatic solutions to nuclear disputes, while maintaining overall effective relationships with the states in question.

The Iranian nuclear problem, which is the most complex of the proliferation dilemmas that the world has recently faced, has posed the thorniest recent challenge for India. Iran's relations with the West are still today almost entirely determined by the state of Iran's nuclear activities. The West has little to do with Iran aside from the nuclear issue, and their diplomatic relations still largely reflect this reality.

India is in a dramatically different position. For India, Iran is a necessary hydrocarbon source; a crucial and like-minded partner in stabilising Afghanistan; and, in the words of Indian Minister of External Affairs S. M. Krishna, a 'gateway to Central Asia' and to India's energy and security interests in that broad region.⁷⁷ Looming in the background of these interests is the spectre of China; New Delhi has been convinced that limiting its interactions with Iran for the sake of global non-proliferation objectives will only create room for China to fill its place.⁷⁸

While India is concerned with Iran's nuclear activities and their possible consequences for global security, this concern is still only one of several

elements in India's relations with Iran. New Delhi has 'de-linked' or 'carved out' the nuclear issue from other aspects of its relationship with Iran: the health of other projects with Iran is largely not determined by the status of the nuclear issue. This approach is not unconventional. Washington attempted 'carving out' its concerns regarding India's nuclear programme from other interactions in its relationship with New Delhi in the late 1990s, before giving way to an implicit acceptance of India's nuclear force a few years later.⁷⁹ India has had genuine concerns about Iran's nuclear activities, and communicates these diplomatically. However, its other interests in the bilateral relationship with Iran, combined with the perception that China is waiting in the wings to swallow any opportunity India forsakes on behalf of the global non-proliferation cause, limit the possibility of its nuclear pressures from threatening these interests.

India has a good relationship with Iran, which long predates the emergence of Iran's nuclear programme as a global concern from 2003 and the subsequent restructuring of Western relations with Iran around the status of this issue. As a fellow member of the NAM, India enjoyed cordial relations with Iran, to the extent that its Iran policy has not been a notable topic of concern in the Indian Parliament.⁸⁰ Recent bilateral initiatives have expanded the ambit of cooperation to include anti-terrorism dialogue and trade and transport projects.⁸¹

A particularly prominent statement of intent was the New Delhi Declaration of January 2003, issued just before the Iranian nuclear issue began attracting global attention. This cleared barriers to bilateral investment and prioritised energy cooperation between India and Iran, bluntly stating that 'Iran with its abundant energy resources and India with its growing energy needs as a rapidly developing economy are natural partners.'⁸²

The revelation by Iranian dissidents of the concealed Natanz uranium enrichment and Arak heavy water reactor facilities in August 2002, and subsequent demands by the leading Western states and the IAEA that Iran remove the resultant concerns surrounding its nuclear intentions, brought a new challenge to Indo-Iran relations. While New Delhi and Tehran still sought progress on the objectives outlined above, the political and economic costs to the Indian government of advancing these projects dramatically escalated as Tehran stonewalled on permitting greater international verification of its nuclear programme. As resolving the Iranian nuclear file rose up the hierarchy of American policy priorities,

Washington increasingly viewed the strength of its relationship with other states through the degree of their willingness to pressure Iran.

This approach also extended to American diplomacy towards India. The US–India Next Steps in Strategic Partnership dialogue, expanding the 2005 joint statement and following negotiations concerning a civil nuclear agreement, necessarily entailed greater Indian exposure to American pressure that it curtail its relations with Iran in response to its nuclear intransigence. This emerging strategic partnership with the US was, in itself, a controversial topic within India, especially among the Leftist parties, which formed part of India's coalition government at the time. Convinced that closer Indian relations with the US would involve sacrificing Indian strategic autonomy to the wishes of a new imperialist superior, the Left opposed the prospective nuclear agreement. It further spotlighted India's Iran policy as a litmus test of its ability to act independently of Washington.⁸³ At the same time, Washington set a litmus test for the Indian government's ability to act as a worthy strategic partner and align with it against Iran in its global diplomacy.⁸⁴ In this way, the India–Iran relationship and its various components came under unprecedented pressure.

New Delhi sought a diplomatic line that would embody a middle approach to satisfy these various pressures. This would also be conditioned by the fact that New Delhi could hardly berate Tehran for its disputes within a treaty regime that India had never belonged to and had publicly condemned as hypocritical and unfair. As a further complication, Tehran was beginning to appropriate the Indian diplomatic language of 'nuclear apartheid' to delegitimise the non-proliferation regime.⁸⁵ This highlighted India's status as an outlier and even a potential wrecker of the NPT system, just as a long-desired accommodation with this system was nearly in India's grasp.

Reflecting these conditions, the line India adopted was a legalistic one: that Iran fully meets the obligations it had committed to as a member of the NPT, with negotiations on this issue to be resolved through dialogue rather than the use of force. India has adhered to this line since then.⁸⁶

However, this has not stopped the litmus tests from being set for it. The most public and visible test was the February 2006 IAEA vote on whether to refer Iran's continuing obfuscations to the UNSC. Several members of the US Congress, responsible for authorising the prospective civil nuclear agreement, emphasised that they would be watching India's

ongoing relationship with Iran closely as a marker of the former's respect for US policy priorities. The US Ambassador to India publicly remarked on the dim prospects for the future of the civil nuclear agreement, should India not vote positively along with the US to refer the Iran nuclear file to the UNSC.⁸⁷

In the face of this tremendous pressure, Indian diplomats sought face-saving ways to prevent its alignment with the US looking like something other than a capitulation. Voting 'with the United States' and 'against Iran', as the decision was almost universally portrayed in the Indian media, New Delhi argued that it had toned down the language of the resolution, and had also successfully fought to grant Iran an additional six weeks before the next IAEA board meeting to recover dialogue with its European Union (EU) 3+3 interlocutors, that is, Britain, France, Germany, China, Russia, the US and the EU High Representative for Foreign Affairs and Security Policy.⁸⁸ Nevertheless, the Indian government was excoriated by significant elements of its polity and media for this vote.⁸⁹ This episode evidently signified India reaching the outer limits of its possible hawkish activism on the Iranian nuclear issue.

A subsequent Indian vote to censure Iran at the IAEA can be viewed as merely retaining a consistent voting stance, given the absence of any change in Iranian behaviour. Indeed, Indian remarks after the 2009 IAEA vote largely featured the same diplomatic language, emphasising that '... the coming weeks should be used by all concerned to expand the diplomatic space to satisfactorily address all outstanding issues. India firmly supports keeping the door open for dialogue and avoidance of confrontation.'⁹⁰

India's other activities directed against Iran's nuclear intransigence consist of responses to the tremendous economic pressures brought upon New Delhi by the unilateral Iran-focused sanctions of the US. Under these sanctions, a failure to significantly reduce oil imports from Iran can lead to Indian banks being denied access to the US financial system.⁹¹ This grave threat led to various Indian efforts to prevent this blockage from materialising. India reduced its imports of crude oil from 21 million metric tonnes in 2009–10 to 11 million metric tonnes in 2014–15. India cut its Iranian oil imports by nearly a third, following a visit by the then US Secretary of State Hillary Clinton to New Delhi in May 2012, during which she had concentrated talks on urging such a measure.⁹² India's central bank cancelled its participation in the Asian Clearing Union system of payment settlements with Iran. Several Indian firms ceased the transport

of Iranian hydrocarbons, or other forms of trade with Iran, due to fear of losing access to the US financial system and also EU sanctions threatening their ability to insure their business.⁹³

However, New Delhi has specified its support for only the UN sanctions in its diplomacy, and has considered ways around the more aggressive unilateral US sanctions of the past. Ideas included creating official front companies for trade with Iran, designed to have no exposure to the US or EU financial systems; encouraging Indian firms to partner with Chinese, Russian or Kuwaiti peers to render the joint venture more difficult for Western investigators to individually sanction; and doing more business in the Iranian rial currency.⁹⁴

India's other important interests in its relationship with Iran contrast with the Western view of Iran that is seen solely through the prism of the nuclear issue, with few other Western projects with Iran at stake. This also explains the relative moderation of New Delhi towards Tehran, as compared to the Western capitals. India's other interests include the mutual opposition of India and Iran towards a Pakistan-sponsored rehabilitation of the Taliban in Afghanistan's government; the Chabahar port project, which will improve India's trade links with Iran, Afghanistan and Central Asia; India's economic and power-projection ambitions in Central Asia; and a pervading sentiment that Indian withdrawal from its economic projects with Iran would merely be gifting these projects to China.

Iran has historic trade links and an interest in stabilising its border areas in western Afghanistan. It has long cultivated links with Afghan politicians and certain anti-Taliban militant groups in order to oppose the efforts of the Taliban and other Sunni militant groups to gain a foothold in Afghanistan. Although nominally independent movements, these latter groups also represent significant arms of Pakistani influence in Afghanistan. India has a mutual interest with Iran in minimising Pakistan's influence in Afghanistan. India has devoted over \$2 billion since 2001 to reconstruction projects in Afghanistan, and has focused its attentions on building infrastructure and training civilian officials.⁹⁵ The intention is to build an Afghan state strong enough to withstand efforts by the Taliban and other Pakistani-sponsored groups to render Afghanistan a weak client state of Islamabad. This suggests that India cannot afford to let its relationships with like-minded regional states deteriorate.

A related element of the Afghanistan imperative is the Chabahar port. Sitting at the far edge of the Indian Ocean and close to the Pakistani border

in Iran, this port permits India a trade route with Iran and Central Asia without the need to transit through Pakistan. The first delivery of goods from the completed port took place in September 2013.⁹⁶ While Indian investment in such infrastructure projects is frowned upon by Washington, they are crucial for India to build its regional trade relationships. Following the announcement of the Lausanne accord in April 2015, two Indian state firms—the Jawaharlal Nehru Port Trust and Kandla Port Trust—have agreed to devote \$85 million to developing container and general cargo berths at the port.⁹⁷

India has several other potentially lucrative economic projects with Iran. An Indian state company, the Oil and Natural Gas Corporation Videsh (OVL), discovered the Farzad-B gas field in the Farsi block in Iranian waters in 2008. The field is estimated today to contain 759 billion cubic metres of gas reserves. OVL operated the development of the field, but had to relinquish its development rights due to growing international pressure on India to cease such economic investments in Iran, and problems with obtaining adequate development technology as a result of the multilateral nuclear-related sanctions on Iran. Iran established an auction for the Farzad-B development rights in 2014. With a less restrictive Western economic approach towards Iran following the conclusion of the Lausanne and Joint Comprehensive Plan of Action accords in 2015, Western firms are likely to compete with OVL for the development contract.⁹⁸

The Chabahar port project, while already substantial, forms one part of a larger Indian initiative to expand its economic connections and influence in Central Asia. The Chabahar port is planned to be an important node in the International North–South Transport Corridor (INSTC), connecting Moscow to Mumbai with an integration of rail, road and sea links. The INSTC group was established in 2000, and includes India, Iran, Russia, and several Central Asian states.⁹⁹ This corridor is estimated to reduce transport time by up to 40 per cent and costs by up to 30 per cent, as compared to the current route through the Mediterranean and Suez Canal.¹⁰⁰ INSTC will improve India's access to the considerable hydrocarbon resources of Central Asia. The region is estimated to hold 11 per cent of global gas reserves, along with significant oil and coal resources.¹⁰¹ As the world's fourth largest energy consumer, securing access to hydrocarbon opportunities like this in Iran and Central Asia is crucial for India's development.

For opening new ground trade routes to Central Asia that avoid Pakistan and Chinese territory, the corridor through Iran also has important

geostrategic incentives for India. New Delhi has hitherto faced an effective veto from Beijing and Islamabad on developing such land connections to Central Asia, due to the unavailability of a route that circumvents their territory.¹⁰² For these reasons, Iran has been recently described by India's Minister of External Affairs as 'a gateway for India to Central Asia'.¹⁰³

Aligning entirely with the Western policy towards Iran and terminating interactions to accelerate its isolation over the nuclear issue would put these major Indian ambitions at stake. Indeed, Indian strategists also feel that this course of action would leave these opportunities on a plate for China, as India's major competitor in asserting strategic and economic influence in Iran and Central Asia.¹⁰⁴

Therefore, there are several major elements in India's relationship with Iran, of which the nuclear issue is but one. India's non-proliferation policy towards Iran communicates its opposition to continued Iranian opacity over its nuclear intentions, through condemnatory votes at the IAEA, implementation of UN sanctions, and, less enthusiastically, implementation of unilateral US sanctions. However, it also seeks to balance this nuclear stance through the other important objectives India has for its economic and security development, such as stabilising Afghanistan, diversifying its trade links, extending influence in Central Asia, and preventing Chinese domination of its neighbourhood. It is this balancing of interests that differentiates India's relationship with Iran from the often sole focus on the nuclear file in Western approaches towards Iran. This balance, and India's preference for a holistic view moderating its relationship with Iran, has also characterised India's stances towards the North Korean and Syrian nuclear disputes.

North Korea and Syria

India has a much more distant relationship with North Korea than Iran, and Pyongyang has far less to offer New Delhi in terms of economic and strategic opportunities than Tehran. India robustly opposes North Korea's efforts to develop nuclear weapons and to use these to blackmail other states for economic and technological concessions. However, it also seeks to develop its relationship with Pyongyang in order to potentially moderate its nuclear behaviour, and help North Korea diversify its trade sources, and thus reduce its economic dependence on China. The overall aim of India's policy evinces the same principles that guide its Iran non-

proliferation policy: of joining with other states in opposing questionable nuclear activities, but not to the extent that the nuclear issue threatens other mutually beneficial aspects of the relationship.

India implements UNSC sanctions against technology trade with North Korea, and communicates its opposition to its nuclear activities in its diplomacy. New Delhi is also aware of the historic links of Pyongyang with the A. Q. Khan proliferation network, and regularly emphasises its concern with 'clandestine proliferation networks' in comments on North Korea. India's Minister of External Affairs, meeting his North Korean counterpart at an Association of Southeast Asian Nations (ASEAN) meeting in July 2013, demanded a halt to any continuing nuclear cooperation with Pakistan.¹⁰⁵ India's activism against North Korean nuclear developments extends to several instances of North Korean ships being detained by Indian officials and their cargo investigated for any nuclear-sensitive material. A recent case in 2009 involved the Indian Coast Guard firing live ammunition to force a North Korean ship to yield to investigation.¹⁰⁶ As some remnants of the A. Q. Khan proliferation network undoubtedly survive, India has strong incentives to prevent Pyongyang from reconstituting these for its benefit and for that of states such as Pakistan or Iran.

However, aside from these efforts to contain North Korea's nuclear activities, New Delhi is also engaged in building other aspects to their relationship. Indian exports to North Korea are largely in the form of metals, pharmaceuticals and textiles, and North Korea, in turn, largely exports iron and steel to India. Indian trade with North Korea amounted to \$208 million in 2014–15, and India was the third largest trading partner with North Korea in 2013, behind only China and Russia.¹⁰⁷

India has also sought other approaches to brighten its image in Pyongyang. It received a North Korean diplomatic mission seeking food aid in 2011, subsequently donating \$1 million in food aid through the World Food Programme (WFP).¹⁰⁸ North Korea's Foreign Minister Ri Su-yong also visited New Delhi in April 2015, meeting with the Indian Minister for External Affairs Sushma Swaraj. It was likely that a North Korean request for additional aid featured in the discussion.¹⁰⁹ An Indian analyst explains Indian outreach to North Korea in the context of New Delhi seeking status as a 'counter-weight' to the influence of Beijing and Islamabad in Pyongyang.¹¹⁰ Creating such economic and aid instruments of leverage on North Korea could indeed strengthen the influence of India's aforementioned nuclear diplomacy.

While it continues to oppose North Korea's nuclear activities, New Delhi simultaneously attempts to cultivate political and economic links with Pyongyang and thereby broaden their bilateral relationship. Similar to its policy towards Iran, the nuclear issue is de-linked from other beneficial aspects of its relationship with North Korea.

This de-linked approach to Iran and North Korea also characterises India's previous position on nuclear developments in Syria. A secret Syrian nuclear reactor, built with North Korean assistance, was destroyed in an Israeli air strike in 2007.¹¹¹ Syria is a fellow member of the NAM, and an Indian commentator has observed that 'Damascus has always been helpful within the Organisation of Islamic Cooperation, Arab League, Non-Aligned Movement and such other forums in regard of Indian interests.'¹¹²

An IAEA vote came due in 2011 regarding whether to refer Syria to the UNSC for continued obstruction of IAEA efforts to resolve questions regarding its nuclear activities. In considering its vote, India faced a similar dilemma to its 2006 vote on Iran. If it acceded to US pressure to demonstrate its credentials as a responsible US strategic partner in voting to censure Syria, it could face a backlash in its domestic politics and among NAM peers for doing Washington's bidding. However, voting against censure would be hypocritical, given India's well-expressed opposition to nuclear proliferation elsewhere. Remaining on the fence, India abstained from the vote. Explaining the vote, Indian diplomats claimed that the evidence for a covert Syrian reactor was not fully persuasive.¹¹³ This position permitted it to continue good relations with Syria. This turn demonstrated again the relegation of nuclear policy concerns to but one element of India's overall relationship with a state, with these concerns never being allowed to threaten the other planks of the relationship.

In each of these cases, India has demonstrated a genuine concern regarding halting nuclear proliferation. In its multilateral diplomacy at the IAEA and UN, it frequently joins coalitions, pressuring for greater clarity from the state in question regarding its activities. In its bilateral diplomacy with the states in question, it urges that the state fully cooperate with the IAEA and UN. However, these stances are moderated by India's traditional holistic view of the nuclear issue as merely one of several different elements in its relationship with the state. Its activism in seeking resolution to the nuclear issue does not become the prime characteristic of its relationship with the state. Even with North Korea, a state with little foreign policy activities which are not related to its nuclear behaviour,

India seeks to build in these other elements to their bilateral relationship through economic trade and food aid. This holistic perspective of India towards non-proliferation issues looks set to continue.

CONCLUSION

This chapter has shown that India has a long-standing and deeply held commitment to restricting global proliferation. However, this approach does not seek to develop the existing structures through which many global non-proliferation policies are coordinated—such as the NPT, CTBT, NSG and FMCT negotiation process—as an end in itself. India has tended to support these institutions insofar as they recognise India's strong nuclear export control record and communicate a willingness to consider India's institutional inclusion without demanding its disarmament as the price of entry.

Indeed, the degree to which India has pursued non-proliferation objectives independent of these institutional settings has been highlighted in this chapter; and it is especially visible in the Indian adoption of a unilateral testing moratorium and the implementing of new nuclear export control regulations. In comparison to many Western states, India can and does conceive of non-proliferation policy as deliverable without specific linkage to or within an institutional framework.

India's overarching attitude towards a non-proliferation policy, as we have seen, is to advance efforts to limit external proliferation that do not involve the sacrifice of important national interests. This may appear an obvious point, but it explains the continuing Indian refusal to countenance both its unilateral nuclear disarmament and its virtual termination of relations with Iran and North Korea in the service of global non-proliferation objectives. The current dilemmas for New Delhi about considering prospective CTBT and FMCT membership reflect unresolved questions regarding the requirements of Indian nuclear deterrence. The influence of these questions outweigh any desires in India to advance these treaties.

This overall approach—a careful conditioning of Indian non-proliferation policy commitments by its broader strategic interests—has lasted decades, and looks likely to continue. However, as this chapter has shown, this stance has not prohibited extensive Indian actions in

support of global non-proliferation objectives, nor excluded its present energetic advocacy for NSG membership and a larger role in global non-proliferation policymaking.

This chapter has highlighted these elements of India's non-proliferation policy approach as part of this book's larger analysis of its nuclear policies and perceptions. However, the chapter has also supported a crucial recurring theme of the book: the need for an Indian strategic defence review. This has been particularly highlighted by our analysis of how India's domestic CTBT and FMCT debates are influenced by the continuing questions regarding its nuclear force reliability and desired arsenal size. A strategic defence review would help deliver assessments and decisions on these issues, with obvious resultant significance for the broader Indian non-proliferation policy stances examined in this chapter.

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Conclusion

As we have seen, Indian nuclear policy is set to face a number of challenges in the coming years. And these have been comprehensively explored in each chapter of this volume.

Our survey of Indian nuclear force development in Chapter 1 revealed the emergence of a new, sophisticated generation of delivery vehicles. There appear to be few political boundaries regarding the technical parameters of this development, which increasingly question India's adherence to the posturing concept of 'credible minimum deterrence'. The Agni-V will bring Chinese east coast targets into range for the first time, but DRDO still remains engaged in a prospective programme to develop an Agni-VI missile of even greater range. Indian interest in multiple-warhead technologies, including potential MIRVs, arguably further undermines 'credible minimum deterrence' as a descriptive term for directions in India's nuclear posture development. These dynamics are further amplified by emerging short-range missiles, including the Prahaar, Brahmos, Nirbhay and Shourya. While the Nirbhay and Shourya appear most likely to be assigned nuclear missions, their potential employment for additional conventional missions increases the potential for adversary misinterpretation of their deployment and use in a crisis. Even if the Prahaar and Brahmos models are not utilised for nuclear purposes, they remain especially suited for conventional counterforce strike operations. Again, their preparation, stationing and launch could be viewed as evidence of an Indian counterforce attack by Pakistan or China, threatening escalatory implications.

Such potential concerns are also becoming more evident in the air and naval domains. The Sukhoi-30 MKI fighter has been assigned both nuclear and conventional missions, as India continues to develop its network of airfields in border areas. The arming of the Sukhoi with the Nirbhay or Brahmos missiles could further elevate the potential for adversary

misinterpretation of Indian air operations, including the conclusion that a conventional counterforce strike is being planned or launched. In the sea environment, the Arihant-class SSBN fleet enters operational service in a naval context, characterised by contested boundaries and aggressive brinkmanship initiatives. The chapter also studied the progress of India's ballistic missile defence programme, which could potentially incentivise Pakistan and China to dedicate additional nuclear force assets to overcome their interception capabilities.

While India's nuclear command-and-control mechanisms are gradually becoming more integrated, further efforts are needed to ensure the operational credibility of India's existing nuclear forces through this system. In light of the multiple nuclear posturing options that these developments place in the hands of India's nuclear planners, this chapter concluded that a public official defence review should be conducted to dispel the growing ambiguities regarding India's future nuclear direction. Such a review would also ensure that India's emerging nuclear force continues to be characterised by the core posturing concepts of 'assured retaliation' and 'credible minimum deterrence', as opposed to movements towards a flexible response doctrine and posture.

Chapters 2 and 3 investigated the contemporary nuclear and conventional threats posed to India by shifts in doctrinal thought and strategic planning within Pakistan and China. Pakistan's previous nuclear operative concept of 'credible minimum deterrence' has been replaced with the new framework of 'full spectrum deterrence', which intends to generate a tailored nuclear threat for virtually every level of militarised crisis with India. The Nasr tactical nuclear missile, as the symbol of this new concept, generates significant nuclear escalatory complications for an Indian conventional strike against Pakistani forces or targets in the land domain. At the upper missile range levels, Rawalpindi is constructing the Shaheen-III, intended to extend its nuclear reach to the Andaman and Nicobar islands, and the multiple-warhead Ababeel, which will further assure the technical certainty of a nuclear strike in an Indian environment that potentially features ballistic missile defence systems.

Pakistan's efforts to introduce seaborne nuclear deterrence are also slowly taking shape, and will further complicate India's strategic context. The dual-use nature of the submarines that Pakistan is most likely to employ for its naval nuclear arm threatens escalation dangers for Indian

anti-submarine operations. Indeed, there is a distinct risk that Pakistan will extend its "full spectrum deterrence" concept to lower the bilateral nuclear threshold with India within their naval competition, and threaten seaborne nuclear responses to perceived Indian maritime incursions.

Indian reactions to these developments further illuminate the blurring of perceived thresholds in this sub-continental nuclear competition. The Indian military is persisting with 'proactive strike' planning to seize Pakistani territory in a conventional conflict, featuring exercises that involve fighting through a nuclear attack. The increasing divergence between New Delhi and Islamabad regarding the location of their nuclear thresholds on the escalation spectrum joins a history of mutual misperception in their previous crises. As the chapter highlighted, these developments further commend the institution of an Indian official defence review to detangle the precise nature of the evolving threats that Pakistan poses to India, and ensure that nuclear forces remain a last-resort option in addressing these. In addition, the different perspectives on regional nuclear thresholds within strategic discourses, and evidence that these discrete perspectives are becoming entrenched in strategic planning, merit the foundation of a trilateral strategic dialogue of India, Pakistan and China. This dialogue would clarify nuclear doctrinal and posturing intentions, and in turn reduce the growing risk of these misinterpretations informing crisis responses.

Chinese military posturing and doctrinal debates are introducing additional complexity into India's strategic environment, as detailed in Chapter 3. China's naval projection already challenges India's traditional presence in the Indian Ocean, and the emergence of the Jin-class SSBN fleet operational patrols could add a nuclear edge to their already tense naval interactions. Recent wide-ranging Chinese defence reforms involve the creation of a new unified Western theatre command facing India, which will host military forces with rapid mobilisation capabilities and a more aggressive posture. Chinese security managers are developing new generations of conventional and nuclear missiles that are likely assigned Indian targetting missions; and these new models feature greater mobility and multiple-warhead potential. Recent missile training programmes simulate environments highly similar to Tibet, and doctrinal writings emphasise the employment of missiles to counteract India's early air and ground force superiority in the border regions. To bolster its military presence against China, Indian planners are establishing new Army Corps

and airfields in border areas, including stationing Brahmos units to pose a credible deep strike threat.

These mutual developments create new opportunities for misperception, and can inform ongoing doctrinal debates within Beijing and New Delhi. Strategic planners are assigning greater importance to potentially nuclear-capable missiles, as security discourses in both states begin to revisit the relationship of conventional conflict to their nuclear no-first-use pledges. In India, a former SFC chief has proposed that New Delhi could retract its no-first-use commitment in a conventional war with China; in China, military analysts have suggested that a conventional attack upon nuclear forces could be treated as nuclear first-use and could permit a nuclear response.

In addition, Indian nuclear force advancements, and the implications of its deepening defence partnership with the US, could soon begin to more directly affect Chinese nuclear debates, threat perceptions and posturing. In particular, they could strengthen the Chinese school of thought that prefers the development of a flexible response doctrine, along with a larger and more technically diversified nuclear force. As the chapter found, a closer degree of interactivity between Indian and Chinese nuclear force modernisations, in a context where there has been virtually no dialogue on this topic, could therefore begin to introduce arms race dynamics.

Chapters 4 and 5 illustrated the history and the core organising concepts of Indian nuclear thought, and explored how the above evolving strategic context is being perceived and debated in Indian strategic circles. Indian nuclear thinking has long been characterised by 'minimum deterrence', including a strong consensus around declaring a no-first-use pledge. These traditions of thought have been visible in official and non-governmental nuclear debates and planning reviews since the 1960s, and were more recently expressed in the 1999 and 2003 nuclear doctrines.

As Chapter 5 highlights, however, the two core tenets of the 2003 doctrine—no-first-use and 'massive retaliation'—are being subjected to increasing debate, given the immensely complex strategic environment that India presently inhabits. The no-first-use pledge is still widely supported, but significant sections of the Indian strategic elite are now beginning to question its viability. Several senior retired officials, including NSAs and the heads of the COSC or SFC, have called for the no-first-use policy to be abandoned, subjected to critical review, or reinterpreted. A case of the latter is a new suggested nuclear doctrine, issued by a panel of highly

respected former officials and nuclear experts, which would reframe India's no-first-use policy as extending to prohibit the 'initiation of a nuclear strike'. Such an 'initiation' would involve activities such as mating warheads to delivery vehicles. This more expansive definition implies that adversary efforts to ready strategic forces could now be viewed by India as equivalent to first-use, and thereby permit an Indian nuclear attack.¹ These lines of thought would indeed seem to dovetail with the remarks of former NSA Shivshankar Menon, who has claimed that the no-first-use pledge, as he understood it, allowed pre-emptive counterforce strikes if an adversary was judged to be planning a nuclear strike.

While there is little sign that the no-first-use pledge within India's nuclear doctrine will be revoked in the near future, these debates still highlight that the changing security scenario in South Asia is forcing India to rethink some of its doctrinal requirements. Indeed, as Menon seems to suggest, the pledge may be quietly reinterpreted (or may already have been) as permitting a wider range of pre-emptive strike options. This policy outcome, and even the mere perception that this is the actual policy, would elevate Pakistan's nuclear threat perceptions, further escalating its nuclear force production to assure survivability. With regard to China, expectations of Indian first-use could encourage early Chinese counterforce strikes in strategic planning, and further pressure its nuclear decisionmakers to adopt a similar pre-emption-friendly interpretation of no-first-use, or revoke the pledge entirely to develop flexible response concepts and forces.

The second commitment, of 'massive retaliation', enjoys less of an Indian consensus around its continuation, as compared to no-first-use. In light of Pakistan's threat to conduct a highly limited, localised Nasr attack against Indian conventional forces, it is becoming more difficult for India to credibly uphold its pledge that widespread nuclear devastation will be its only response to any nuclear first use. However, the movement towards resuming the 'punitive retaliation' commitment—as was originally outlined in the 1999 doctrine—could entail the development of nuclear warfighting capabilities, and would still not address the ongoing challenge of deterring first-use by Pakistan. These nuclear debates, as well as the increasing pressure they place upon the tenets of India's 2003 nuclear doctrine, highlight the need for a new Indian official defence review to situate India's emerging nuclear capabilities in the changed strategic context that it faces in 2017.

Chapter 6 analysed how India is managing its rise in the global nuclear order, as an important aspect of its overarching nuclear policy. The chapter found that, in its approach to both state-specific non-proliferation challenges and the broader regimes that constitute the nuclear order, India is deeply committed to limiting proliferation, so long as these efforts do not require New Delhi to sacrifice its other important national interests. India has supported the institutions of the NPT, CTBT and NSG, insofar as they themselves recognise India's record and are open to India's greater institutional involvement without first demanding its disarmament. With respect to recent proliferation challenges such as with Iran and North Korea, India has taken substantive measures to enforce sanctions intended to curtail their nuclear activities.

However, taking a view of its broader strategic interests towards these states, India has still continued economic and energy engagements with Iran, to counteract Pakistan's regional presence and support its own internal economic development. Indian diplomats continue to interact with North Korea and engage in food aid and limited trade initiatives, to potentially reduce Beijing's economic leverage over Pyongyang and also to amplify India's voice in efforts to moderate North Korea's nuclear adventurism. India will remain committed to reducing nuclear proliferation, but efforts by the US and other actors to pressure New Delhi to take actions that more directly threaten its broader national interests—such as the survival of its nuclear force, its pressing energy and economic developmental needs, and the necessity for a rising power to maintain positive relations with core states in its regional calculus—are unlikely to succeed.

This book has argued that the above developments represent conditions particularly conducive to accidental and inadvertent escalation. Risk areas leading to inadvertent escalation—where a decision is taken at the military operational level that has unplanned escalatory consequences—are becoming visible in multiple areas of the current regional security context. The first principal factor conducive to inadvertent escalation risk is the looming extension of South Asia's nuclear competition into the naval domain. China, India and Pakistan have little operational experience of managing naval nuclear deterrent forces, as of ensuring safe patrols in contested naval environments. There has been little discussion on how to limit the escalatory implications of the SSBNs of one state being targeted by an adversary anti-submarine operation, among other potential future scenarios. These dangers are worsened by the intentions of all three states

to expand their naval spheres of influence. India intends to increase its patrols into the South and East China Seas, while recent Chinese forays have approached the Indian Andaman and Nicobar islands. As Pakistan invests in a new generation of naval forces, including eight Chinese submarines, it is likely to wish to expand its own patrol areas.

Even if the nuclear-armed vessels of each state do not regularly stray close to national littorals, these developments still pose an increased risk that they will come into contact with adversary conventional forces. Indeed, Pakistan is particularly incentivised to falsely claim that far-reaching patrols are nuclear-armed, in order to deter any Indian responses, and thus bolster new naval territorial claims. This form of nuclear threat would lead to an application of Pakistan's logic of 'full spectrum deterrence' to the naval domain, just as the nuclear-armed *Nasr* is employed to deter the most potential significant Indian conventional actions in the land domain. The increased risk of the intermingling of conventional and nuclear naval competition should be addressed by naval services in their training programmes, and by policymakers through enhanced strategic dialogue.

The second area of inadvertent escalation risk that has been identified in this book consists of the rising prominence of dual-use platforms as potential nuclear delivery vehicles. In the realm of seaborne deterrence, the Type-041 Chinese submarine model appears to be a likely candidate to serve as part of Pakistan's emerging nuclear force, as it simultaneously constitutes the core of the next generation of Rawalpindi's conventional naval projection. The Babur cruise missile, as well as possibly the C-802 anti-ship missile, could also receive dual conventional and nuclear assignments. In India, the Sukhoi Su-30 MKI fighters have been allocated nuclear missions by the SFC, while they form an essential component of the IAF's deep strike planning. Furthermore, the Brahmos, Nirbhay and Prahaar missiles could all be designated with nuclear roles, or perceived as such by adversaries. This trend is also highlighted in Chinese strategic planning, with a new emphasis on introducing conventionally-armed variants of the DF-21 missiles that likely have Indian nuclear targetting missions. These developments increase ambiguities regarding the true constitution of regional nuclear forces as perceived by adversaries, as well as risks of misperception of the nuclear significance of an adversary missile movement or launch.

These transitions link with the third area of growing inadvertent escalation risk, consisting of the rising interest of China, India and Pakistan

in early consequential missile strikes upon enemy territory to seize the operational initiative. This thinking assigns increased importance to the utilisation of potentially dual-use missile platforms in conventional orders of battle, as well as towards efforts to quickly locate and destroy adversary missile units to avoid their use. In China, military analysis of potential conflict scenarios with India has focused upon employing conventional missile strikes to counteract Indian air and ground force advantages in border areas. More broadly, Chinese strategic thought has emphasised the heavy early employment of conventional missile attacks upon enemy command hubs, population centres and significant force concentrations to ensure conflict termination on its terms. Such targets could extend to Indian bases or forces that have nuclear roles, such as the IAF Ambala base. These tactics could also force a significant degradation of the Indian conventional forces in the initial stages of conflict, placing intra-crisis pressure upon its nuclear threshold. In India, the Prahaar and Brahmos are attaining increasing significance in Indian Army and Air Force forward strike planning, and are well-suited to targetting enemy missile units. Retired Indian military officials have indicated that the destruction of adversary missile capabilities is indeed an early priority in conflict scenario planning; and that they do not differentiate between the conventional and potential nuclear missions of these targets. Pakistan is assessed to be likely to integrate the conventionally-armed Babur cruise missiles into its strike planning against India.

These shifts generate dangers of inadvertent counterforce strikes, as well as create additional room for crisis misperception. Moreover, the high-pitch, low-duration form of conflict promised by the emphases on early missile strikes threatens to pressure the nuclear thresholds of all three states, in case they judge that their conventional defences have been substantively and unexpectedly eroded at only the early stages of the conflict.

These three inadvertent escalation risks are joined, and amplified, by two accidental escalation concerns. Accidental escalation, employed as a concept in this book, places more comparative emphasis on the implications of misperceptions by political leaders and security communities than military operational commanders for unplanned escalation dynamics. The first area of concern constitutes aggressive trends within the doctrinal debates of China, India and Pakistan. In China, a school of nuclear thought has emerged, which urges that the no-first-use

policy be abandoned, and a larger and more diversified nuclear force be built to assure China's general deterrence. This school draws some of its argumentative power from an assessment that China's surrounding strategic environment is becoming more threatening, with the growing credibility of Indian nuclear forces contributing to this reading. Influenced by Indian strategic developments, if such thinking were to gain ground in Chinese doctrinal planning, it would naturally make it far more difficult for Indian security managers to discern which operations and targets could approach China's nuclear threshold.

As analysed in Chapters 4 and 5, there exist similar growing pressures within the Indian strategic discourse to adopt a flexible response doctrine and nuclear warfighting capabilities. This coincides with the recent revelation that Indian decisionmakers may have reinterpreted their understanding of no-first-use to enable pre-emptive counterforce strikes, and the development of new platforms—such as the Shourya, Prahaar, Brahmos and Nirbhay missiles—that could be employed for nuclear or conventional counterforce attacks. These combined developments, in turn, could lead security planners in Pakistan and China to conclude that Indian nuclear force capabilities no longer correspond with the 'credible minimum deterrence' posture and no-first-use pledge, meriting reactive force expansions to prepare for eventualities. Doctrinal transitions in Pakistan are more undeniable; the new 'full spectrum deterrence' concept, in threatening nuclear escalation to most Indian conventional attack scenarios, significantly elevates escalation dangers in the sub-continent. This is worsened by Indian efforts to develop proactive strike concepts that fight through first nuclear use by Pakistan.

These nuclear debates and doctrinal transitions are exacerbated by the second area of accidental escalation risk: the near-absence of regional strategic dialogue, denying policymakers opportunities to reduce the dangers arising from each of the above concerns. Instituting such a dialogue would help all three capitals to better determine adversary nuclear and conventional intentions and perceptions; potentially lead to the development of confidence-building measures and crisis resolution mechanisms; and reduce the risk of unplanned escalation based upon some of the above misperceptions taking root in a conflict.

Particular early topics for discussion, based upon the developments outlined in this book, could include: first, the meaning of the doctrinal

concepts of 'no-first-use', 'full spectrum deterrence', 'minimum deterrence' and 'credible minimum deterrence', as decisionmakers apply them in strategic planning. This could lead to interactions regarding how each state would view significant conventional strikes, including those on nuclear or nuclear-capable bases and units, in relationship to their nuclear thresholds. As this dialogue is advanced, more sensitive topics could involve listing the precise delivery vehicle types that constitute national nuclear forces, so as to reduce the risk of inadvertent targetting of nuclear units, as well as the misperception of conventional force movements or attacks as the early stages of a nuclear strike. Procedures to enable the safe operation of seaborne nuclear forces, including demarcating the likely patrol areas and units of these forces, could also be discussed. These interactions could potentially develop protocols to de-conflict patrol routes and manage scenarios in which a nuclear-armed vessel comes into contact with adversary conventional forces.

As mutual strategic trust develops through regular iterations of this dialogue and progress on these concerns, further initiatives could be adopted to address the growing risks of nuclear misperception. Negotiating a regional flight-test pre-notification agreement, incorporating both ballistic and cruise missile tests, would reduce the possibility of missile test launches to be read as initial nuclear strikes. Dialogues on ballistic missile defence intentions, including potential limits on the systems fielded and areas protected, could curtail a potential source of demand for larger nuclear arsenals with multiple-warhead capabilities. The three states could also agree to structurally disaggregate their conventional and nuclear forces, with platforms assigned to the two separate missions located at different bases and operating with different preparation and movement signatures as far as is practicable.

While there may be a temptation in all three capitals to instead increase the ambiguity that new dual-use platforms promise on land or sea—for example, in bolstering conventional brinkmanship by suggesting to the adversary that a platform involved is nuclear-armed—this risks activating one or several of the above unplanned escalatory dynamics. As Kelleher argued with regard to the North Atlantic Treaty Organisation (NATO)–Soviet context, clearly dividing nuclear from conventional forces in this way permits a state to better signal the precise escalatory rung of a conflict to an adversary, and thus avoid unplanned escalation and aid crisis resolution efforts.² Following the same logic, deliberate conventional

targetting of nuclear forces should also be avoided by all three states as another outcome of these diplomatic strategic interactions.

As well as arguing that India attempt to initiate such a trilateral dialogue, this book has also argued that Indian security would be furthermore well-served by conducting a public official defence review. India's nuclear doctrine has not been updated since 2003, and its general defence policy and force development have never been subjected to a review process. Much of the impetus in India's doctrinal debate to assign a more expansive role to nuclear weapons emanates from a concern that Indian conventional force modernisation is not keeping up with the evolving threats posed by Pakistan and China. A public official defence review would involve new assessments of the specific nature of the strategic challenges posed by China and Pakistan, both conventional and nuclear, and a review of which threats are best met by conventional and nuclear defences, respectively. This public disaggregation of threats, in line with the structural detangling of conventional from nuclear forces suggested above, should ultimately reiterate the historical Indian perspective of nuclear weapons as serving only a last-resort role, with an 'assured retaliation' rather than a warfighting posture. This would lead to political limits being placed upon its force size and destructive capacity, as part of rejecting a nuclear warfighting concept.

India's future nuclear policy will necessarily form a significant part of its growing influence in international politics in the twenty-first century. Renewed effort to conduct an official public defence review and towards establishing a trilateral strategic dialogue is required. This will help reduce the risk of India's nuclear rise being complicated by the rising challenges in its strategic environment, and accidental or inadvertent escalation arising from a misperception of these. As India's nuclear context obtains increasing significance with its rise as a global power, close attention will need to be paid by New Delhi to addressing these concerns in the coming years.

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